E/2047/Rev.1
ST/ECA/15

Instability in Export Markets of Under-Developed Countries

UNITED NATIONS

Price 7s. 6d. net

International Trade

E/2047/Rev.1 ST/ECA/15
September 1952

UNITED NATIONS PUBLICATION

Sales No.: 1952. II.A. 1

Price: $1.00 (U.S.)
(or equivalent in other currencies)

FOREWORD

This study of fluctuations in export markets was prepared in response to resolution 294 D (XI), adopted by the Economic and Social Council on 12 August 1950. Paragraph 17 of the resolution requested the Secretary-General,

> ". . . in co-operation with the interested international agencies and within the resources available, to undertake a study of the relation of fluctuations in the prices of primary products to the ability of under-developed countries to obtain foreign exchange".

In accordance with the terms of the resolution, the present study is limited to consideration of fluctuations rather than actual prices of exports of primary commodities; the relation of the latter to import prices was the subject of an earlier report, *Relative Prices of Exports and Imports of Under-Developed Countries*. The present report analyses the stability, rather than the structure, of prices. The study is concerned with exports of primary products by under-developed countries and not with exports of primary producers in such economically developed areas as Australia, Canada, western Europe and the United States. It concerns world market prices rather than domestic prices in the countries studied.

A preliminary version of the present study was submitted in mimeographed form to the Economic and Social Council at its thirteenth session, under the title, "Relation of Fluctuations in the Prices of Primary Commodities to the Ability of Under-Developed Countries to Obtain Foreign Exchange". As explained in appendix B of the present report, the method of computing fluctuations has been changed, and the data in the two reports are therefore not strictly comparable.

This study was prepared by the Economic Development Section of the Division of Economic Stability and Development in the United Nations Department of Economic Affairs.

EXPLANATORY NOTE

The following symbols have been used throughout the report:

Two dots (. .) indicate that data were not available

Three dots (. . .) indicate that computations were not made for the particular item

A dash (—) indicates that the amount is nil or negligible

A blank in a table indicates that the item is not applicable

A minus sign (–) indicates a deficit or decrease

A full stop (.) is used to indicate decimals

A comma (,) is used to distinguish thousands and millions

A slash (/) indicates a crop year, fiscal year or other twelve-month period, e.g., 1949/50.

Use of a hyphen (-) between dates representing years, e.g., 1934-38, normally signifies an annual average for the calendar years involved, including the beginning and end years. "To" between the years indicates the full period, e.g., 1901 to 1950 means 1901 to 1950, inclusive. "Per year" refers to a twelve-month period, not necessarily a calendar year.

References to "tons" indicate metric tons, and to "dollars" United States dollars, unless otherwise stated.

Details in tables do not necessarily result in the exact totals or averages given, because of rounding. Averages in the tables are shown in italics.

In all tables in which the symbols "±", "+" and "–" are given before the final averages, they apply equally to individual averages in the column.

Increases are measured as a percentage of the terminal high point (see appendix B), while decreases are measured according to the conventional method.

Information on India pertains to the subcontinent of India and is thus inclusive of Pakistan. Similarly, data for Trinidad include Tobago as well.

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Chapter 1

INTRODUCTION

Exports play a strategic role in under-developed countries in determining national income, rate of savings and of capital formation, monetary stability and the progress of economic development programmes. The instability experienced by under-developed countries in their foreign exchange receipts from exports — particularly if reinforced by similar fluctuations in other credit items in their balances of payments — imposes severe handicaps in maintaining steady investment in development programmes over a period of years. Even if the rate of capital accumulation were not affected by fluctuations in real income and money circulation, development programmes would be disrupted if foreign exchange were not available as required. Furthermore, if development projects are expected to result in the production of exportable goods, calculations of cost and income may be completely upset by wide fluctuations in price and demand.

Since the price and volume of imports tend to fluctuate less than in the case of exports, the balance of trade — and consequently the balance of payments — tends to be active during periods of prosperity and passive during depressions. Although world-wide booms and recessions may be avoided or mitigated, sharp fluctuations in particular commodities or market conditions will undoubtedly persist.

A degree of fluctuation such as that indicated by this study threatens under-developed countries with inflation in both prosperity and depression. During recessions, reduction in export proceeds and balance of payments deficits encourage the devaluation of currencies or restriction of imports; both measures may increase inflationary pressure on prices. Conversely, the money income of exporters may expand so rapidly in times of increased demand that domestic controls become inadequate to prevent inflation, and increased export proceeds are dissipated for imports which absorb purchasing power and reduce inflation rather than used to import goods required for economic development. In many cases, the transitory nature of temporarily high proceeds from exports makes it difficult to provide for their most beneficial use within the under-developed country. Such proceeds, furthermore, are sometimes sent abroad.

Wide price fluctuations, such as those described here, also prevent under-developed countries from utilizing their foreign exchange assets for financing economic development. If export proceeds fluctuate, larger balances must be maintained abroad in order to guard against substantial declines in exports.[1]

In general, price fluctuations have resulted in less-favourable terms of trade for under-developed countries. The secular trend in prices of primary commodities relative to prices of manufactured goods was downward from the latter part of the nineteenth century to the eve of the Second World War, according to the earlier study mentioned above, *Relative Prices of Exports and Imports of Under-Developed Countries*.[2] At the end of this period of well over half a century, a given volume of exports of primary commodities would pay, on an average, for only 60 per cent of the quantity of manufactured goods which it could buy at the beginning of the period. The upsurge in commodity prices beginning in the autumn of 1949 caused an apparent gain of 20 per cent in the terms of trade of under-developed countries, but this gain has been reduced as a net result of wide fluctuations since that time.

The present study is confined to the measurement of fluctuations and does not cover possible methods of dealing with problems raised by the type of instability described here. Such methods were discussed by a group of experts appointed by the Secretary-General of the United Nations, at the request of the Economic and Social Council, in the report, *Measures for International Economic Stability*.[3]

Scope and Limitations of the Study

Coverage

In the main, the report is based on findings relating to eighteen important primary commodities which represent the major exports of selected under-developed countries — a total of forty-seven case studies. The sample of commodities and countries chosen is by no

[1] For instance, in the report by the Commonwealth Consultative Committee on the Colombo Plan, it is stated in respect of Ceylon that "the Government deem it imprudent to draw down their sterling balances by more than Rs. 250 million, since the amount not needed as a currency reserve is required to cushion the economy against the uncertainties of international trade". Cmd 8080 (London, 1950).

[2] United Nations publication: 1949.II.B.3.

[3] United Nations publication: 1951.II.A.2.

means exhaustive. The selection was based to some extent on the importance of the commodity in international trade, or in the trade of the countries considered, and on the availability of data over a period of time. While the findings may not be valid for commodities which were not studied, those which were included form the major part of the total exports of under-developed countries, and to this extent the findings may be considered significant. Certain parts of the study are based on a larger number of commodities and their subvarieties; these data, however, cover sales in only a single major market. General data relating to aggregate exports — or aggregate imports — of primary commodities have also been used, but such aggregates tend to conceal fluctuations in differing directions among various commodities. On the whole, the commodities studied are considered sufficiently representative for the purposes of this report.

Data in the report refer in large part to the period from 1901 to 1950, though some of the more detailed figures relating to trade with the United States cover only the thirty-year period beginning in 1921. In some cases figures for 1951 have also been included.

Sources

The report is based in large part on trade and unit value statistics of economically developed countries, because of difficulties in converting trade returns of under-developed countries into common currency units. Since, however, the study is concerned with variations rather than absolute magnitudes, the results would probably have been the same if the trade returns of under-developed countries had been used.

The prices considered in this study represent world market prices obtained by exporters, not domestic prices obtained by local producers. This approach represents a departure from previous studies which relate to fluctuations in prices of primary commodities in domestic markets.

Unless otherwise noted, the sources of data for the tables in this study are those described in appendix A.

Units of measurement

Both market prices and foreign trade unit values were utilized in the course of the study. Foreign trade unit values were used whenever available in suitable form, because of their direct relation to the ability of under-developed countries to obtain foreign exchange. Market prices have also been given in a limited number of cases, partly to study the relationship between market prices and unit values. It was found that with free markets and convertible currencies, foreign trade unit values tended to follow market prices, subject to a time lag of about six months. Although such a lag may affect the earnings of producers in under-developed countries at a given time, the degree of fluctuation in prices or receipts does not differ significantly when measured in market prices or in foreign trade unit values, except for short-term variations.

In general, prices and export receipts have been given in terms of money values. In important respects, such as the ability of under-developed countries to undertake fixed commitments, fluctuations in monetary rather than real terms are relevant. In certain other respects, such as the ability to buy imports, real fluctuations in prices and receipts are of importance, and are also discussed in the study. On the whole, fluctuations measured in real terms were not significantly different from those measured in money terms, and the limitation of some of the data to monetary terms therefore does not change the conclusions.

Throughout the study, a distinction has been made between market prices and foreign trade unit values. If special bilateral or multilateral long-term purchase contracts are in force, average unit values obtained by exporters may differ from market prices. Over long periods, prices under bulk purchase arrangements or other agreements have tended to approach free world market prices in convertible currency. These special price arrangements have been made during a period of rising world market prices; their effect has been to approach higher price levels in fewer, but larger, steps than in the case of world market prices. So long as the general price trend is uniformly upward or downward, fluctuations are concentrated in one or two years during the period instead of being spread more evenly, but average year-to-year fluctuations over a long period are not otherwise affected by such special prices.

In general, foreign trade values throughout the study represent United States import unit values. These have the advantage of being expressed in comparable and convertible currency throughout and of being computed on an f.o.b. basis; that is, they measure the value of primary commodities at the point of exit from under-developed countries, exclusive of subsequent transport, insurance and other charges. They thus tend to reflect more accurately the prices actually obtained by exporters in under-developed countries than do the import values of most other countries — including the United Kingdom — which are computed on a c.i.f. basis.

Between 1901 and 1930, United States import values appear to reflect prices actually obtained by under-developed countries for their major exports in other markets as well. From 1931 to 1939, United States import values also generally apply to sales in the United Kingdom and some other European markets, but are not representative in the case of under-developed countries which sold a significant part of their exports in Germany and Japan. After 1939, the level of foreign trade values obtained in the United States may have differed quite sharply from that in

other markets. Since this study is concerned with fluctuations, rather than actual prices, the conclusions are not necessarily affected by such differences.

Nature of analysis

Prices, export volume and export receipts have been measured in respect of year-to-year, cyclical and long-term fluctuations, as well as variations within the period of a year.[4] In large part, year-to-year and cyclical fluctuations have been the chief concern of this report, since it is difficult to evaluate such major secular forces as conditions of trade and production, degree of economic development, conditions for international investment and other underlying factors against which the influence of long-term changes in commodity prices must be assessed. Nearly all the commodities studied showed marked price cycles, that is, successive swings of commodity prices extending over several years, during which prices reached points considerably higher or lower than at the beginning of the swing. Since the year is the usual accounting unit, and government policies are generally based on expectations of available resources during the current and the subsequent year, year-to-year fluctuations have decisive effects on planning and budgeting. Fluctuations within the period of a year introduce an additional element of uncertainty and instability in the financing of economic development;[5] because of this type of fluctuation, export proceeds may be largely conditioned by such accidental factors as the time of the year when a major sales contract becomes effective.

Retention of proceeds

The foreign exchange proceeds available to under-developed countries from exports frequently differ from the amount of foreign exchange earned, particularly if exports are handled by foreign companies operating under concessions or special contracts, and with special market connexions abroad. Appendix C contains data concerning retained export receipts from Chilean copper, but it was not possible within the scope of the present study to undertake further detailed analyses of the relation between foreign exchange actually retained and price fluctuations of primary commodities.

Statistical measurement

Since the conventional measurement of percentage changes, which states an increase in relation to the lower starting point and a decrease in relation to the higher base period, gives rise to inequalities in the statement of the degree of rise and fall and so tends to distort comparisons between them, it was deemed necessary to adopt a common base for measuring the degree of rise and of fall. For the purposes of this study, the higher of two points is considered the base. This involves no departure from conventional measurement in the case of a drop in value; but in the case of a rise, the percentage change represents the degree by which the lower point falls short of the higher point, rather than the percentage change from low to high, and is therefore smaller than that obtained in the conventional manner. Except in extreme cases, the divergence from conventional measurement is not very great. The method of measurement is discussed in greater detail in appendix B.

Other factors in fluctuations

Foreign exchange available to under-developed countries for imports does not fluctuate in exactly the same way as foreign exchange export earnings or current capital imports. Under-developed countries may have foreign exchange reserves to even out fluctuations in their foreign exchange receipts; however, such reserves are often small, and they tend to be strained by the requirements of development programmes. In addition, a number of under-developed countries are members of currency groups in which some pooling of foreign exchange earnings takes place. For example, the importing capacity of a member of the sterling area may fluctuate with variations in its own export proceeds and also, to some extent, with variations in the export proceeds — and possibly the imports — of other members of the sterling area.

Summary of Findings

According to the data presented in this study, there have been marked fluctuations in proceeds from exports during the fifty years under review — whether measured on a cyclical basis or from year to year. While different commodities and countries have been variously affected, practically all showed a substantial degree of instability. Price fluctuations were not the major factor in the instability of export proceeds; on the whole, the volume of exports has fluctuated even more than the price. The contribution of fluctuating volume to the instability of export proceeds is especially evident in the sales of specific varieties and grades of primary commodities by under-developed countries.

Fluctuations in unit value or market price

The main findings of the study with respect to price fluctuations, for the four kinds of fluctuation

[4] Long-term variations in prices of primary commodities in relation to prices of manufactured goods were discussed in *Relative Prices of Exports and Imports of Under-Developed Countries*, mentioned above.

[5] See J. M. Keynes, "Policy of Government Storage of Foodstuffs and Raw Materials", *Economic Journal*, September 1938.

distinguished — year-to-year, cyclical, long-term and within-year — are shown in table 1. Year-to-year fluctuations in price averaged about 14 per cent; that is, in an average year of falling prices, export proceeds declined 14 per cent if the volume remained stable. A reduction of 14 per cent from a previous level of prices and proceeds might cancel the profits and destroy the economic justification of development projects which depend on the sale of primary commodities in foreign markets. Exporters of primary commodities might expect the following year's prices either to fall from 100 to 86, on an average, or to rise from 100 to 116,[6] with the possibility that the actual change might be outside these limits, that is, above 116 or below 86. Average year-to-year fluctuations in export prices of individual commodities ranged from 5 per cent to 21 per cent for different commodities. Copra, cotton, hemp, linseed, rubber and shellac were the commodities with the widest fluctuations in prices from year to year. No significant difference in stability was found in comparing United States import unit values with market prices.

The intensity of year-to-year price fluctuations increased successively in the three peace-time periods analysed — 1901 to 1913, 1920 to 1939 and 1946 to 1950. The instability of prices during the Second World War was less than during the First World War, but in excess of the period before 1914.

In the larger sample of about 200 varieties and specified grades of commodities sold by under-developed countries in the United States market, the average year-to-year fluctuation in unit value was even greater than for broadly defined commodities, namely, 17 per cent instead of 14 per cent, showing the greater degree of instability that specialized exporters encountered.

Analysis of exports to the United States from under-developed regions as a whole indicates that the vulnerability of under-developed countries to price fluctuations is much greater than that of other exporters to the United States, but it is less than the vulnerability of individual exporters selling particular commodi-

[6] According to the method of measurement adopted in this study, a rise of 16 points represents 14 per cent of the higher point reached, that is, 116.

Table 1. Summary of Year-to-Year, Cyclical, Long-Term and Within-Year Fluctuations in Prices of Major Primary Commodities,[a] 1901 to 1951

(Average percentage fluctuation per year)

Commodity	*Year-to-year*	*Cyclical*		*Long-term*		*Within-year*
		Upswing	*Downswing*	*Rising phase*	*Falling phase*	
Bananas	5	3	3	1	2	..
Cocoa	17	16	18	5	4	32
Coffee	14	18	13	5	6	26
Copper	13	14	11	5	4	22
Copra	19	15	16	6	4	..
Cotton	18	16	19	5	5	30
Hemp	19	15	16	6	3	..
Hides and skins	13	12	13	6	4	..
Jute	16	15	20	4	7	32[b]
Linseed	18	19	15	6	4	..
Manganese	11	6	6	4	3	..
Nickel	5	4	3	3	1	..
Petroleum	10	9	9	6	4	..
Rice	12	13	16	3	4	..
Rubber	21	18	15	5	7	37
Shellac	19	22	15	9	6	..
Silk	14	12	21	6	6	..
Sisal	16	15	12	5	5	..
Sodium nitrate	5	6	9	4	3	..
Sugar	15	12	14	4	6	19
Tea	9	8	11	3	5	29[b]
Tin	14	11	14	3	4	26
Tobacco	10	10	10	6	4	..
Wheat	16	15	11	4	4	30[b]
Wool	15	14	13	4	5	27
AVERAGE, 25 COMMODITIES[c]	*±13.7*	*+12.8*	*−13.0*	*+4.7*	*−4.3*	*26.7*[d]

Source: Unless otherwise noted, the sources of data for the tables in this study are those referred to in appendix A.

[a] Fluctuations represent changes in import unit values, except in the case of within-year fluctuations, which pertain to market prices.

[b] Excluding fluctuations during the Second World War.

[c] In all tables in which the symbols "±", "+" and "−" are given before the final averages, they apply equally to individual averages in the column.

[d] Average for 11 commodities.

ties; some compensatory movements take place within under-developed regions.

Fluctuations in unit values or prices are not significantly lower when the purchasing power of such unit values or prices with respect to manufactured imports is taken into account. Fluctuations from year to year in the real purchasing power of export prices averaged between 13 and 14 per cent a year.

Cyclical declines in prices averaged about 27 per cent; on the average, the full cycle covered about 4½ years. Cyclical swings in the case of individual commodities ranged from 5 per cent to 40 per cent. Thus, on an average, under-developed countries exporting primary commodities experienced a decline from 100 to a little over 70, and a rise again to 100 in the prices obtained for their products within a period of four or five years, with the possibility that the actual fluctuation would be even greater. The vulnerability to price fluctuations was greatly increased by the fact that year-to-year movements tended to be in the same direction for two to three years at a time.

The annual rate of cyclical movements — both upswing and downswing — was about 13 per cent. Since this was almost equal to the average year-to-year movement of prices, the cyclical factor appeared to be the most important causative force in price instability.

Long-term price changes, as determined by a seven-year moving average, amounted to between 4 and 5 per cent a year in either direction; variations in individual commodities ranged from one per cent to 9 per cent. While the annual range of long-term changes was smaller than in either year-to-year or cyclical fluctuations, total long-term variations were marked — even exceeding cyclical changes.

Fluctuations within the period of a year averaged about 27 per cent (the percentage of change from the high point to the low point of each year). Thus, the proceeds from sales of exports by under-developed countries within a given calendar year might vary considerably, according to the season when sales took place or contracts were drawn up.

The data disclose evidence of correlation between degrees of price fluctuations among different commodities. Commodities which tended to be specially vulnerable — or stable — in respect of year-to-year price fluctuations also tended to be vulnerable — or stable — in respect of cyclical and long-term fluctuations.

Fluctuations in volume of exports

Average year-to-year fluctuations in the volume of exports of primary commodities, summarized in table 2, were between 18 and 19 per cent a year, thus exceeding fluctuations in price by a considerable margin. Under-developed countries exporting primary commodities experienced an average drop in export volume from 100 to 81, or rise from 100 to 123,[7] from one year to another, with the possibility that the actual changes would be greater in magnitude. The range in average year-to-year fluctuation among different commodities was from 6 per cent in the case of wool to 33 per cent in the case of wheat. In respect of year-to-year fluctuations, changes in volume contributed more to instability of proceeds than changes in price.

[7] A rise from 100 to 123 represents an increase of about 19 per cent of the higher point reached, that is, 123.

Table 2. Summary of Year-to-Year, Cyclical and Long-Term Fluctuations in Export Volume of Major Primary Commodities, 1901 to 1950

(Average percentage fluctuation per year)

Commodity	Year-to-year	Cyclical		Long-term	
		Upswing	Downswing	Rising phase	Falling phase
Cocoa	17	19	19	3	2
Coffee	12	15	12	2	2
Copper	16	18	12	5	3
Cotton	21	19	20	4	4
Hemp	17	12	11	2	2
Jute	17	15	16	4	5
Linseed	31	27	18	6	7
Petroleum	18	11	12	4	5
Rice	21	23	16	4	5
Rubber	29	25	21	5	7
Silk	13	9	6	3	..
Sodium nitrate	22	24	25	5	6
Sugar	18	15	17	4	5
Tea	10	12	10	3	4
Tin	18	16	17	4	5
Tobacco	16	19	17	5	4
Wheat	33	32	39	6	6
Wool	6	5	5	2	3
AVERAGE, 18 COMMODITIES ±	*18.7*	*+17.6*	*−16.8*	*+4.0*	*−4.1*

Fluctuations in the volume of exports in the period from 1920 to 1939 were smaller than those before 1914, but they increased sharply after 1945. Fluctuations were equally wide during both world wars. In each of the sub-periods studied, volume was less stable than price.

While year-to-year fluctuations in volume were greater than in price, total cyclical movements were similar. However, owing to the fact that cyclical movements in volume tended to be shorter and more concentrated than in price, the annual rate of cyclical fluctuation in volume was higher than the corresponding rate for price cycles. Total amplitude of cyclical fluctuations in volume ranged from under 10 per cent to over 50 per cent for different commodities. On an average, cyclical variations caused export volume to decline from 100 to 73 and to return to 100 within four years.

Changes in export volume due to long-term factors were similar in magnitude to long-term price trends — about 4 per cent a year.

Year-to-year fluctuations in the volume of exports to the United States were greater for under-developed regions as a whole than for the average of all exports to the United States; the oversea sterling area had the greatest fluctuation.

There was a close relation in the rank of individual commodities in respect of the various types of fluctuation in volume. Commodities which were particularly stable — or unstable — in respect of year-to-year changes in volume were also particularly stable — or unstable — in respect of cyclical and long-term changes.

Fluctuations in total export proceeds

Year-to-year fluctuations in export proceeds from eighteen major primary commodities, summarized in table 3, averaged 23 per cent between 1901 and 1950. Thus, on the average, under-developed countries exporting primary commodities experienced a drop in export proceeds from 100 to 77, or a rise from 77 to 100, from one year to another; in about half the cases, the instability was even greater. There was little change in the degree of year-to-year instability in export proceeds between 1901 and 1945, but since the war there has been a more marked increase in fluctuations.

Varieties and grades of particular commodities showed much greater instability of proceeds — amounting to 37 per cent, on the average, for over 200 varieties analysed with respect to sales in the United States.

Cyclical fluctuations in proceeds amounted to about 37 per cent in total amplitude, and the average cycle covered a period of a little over four years. On the whole, export proceeds fell from 100 to 63 and subsequently rose again to 100, all within the space of a little over four years. The annual rate of cyclical rise or fall was close to the average year-to-year rise or fall, indicating that most of the instability of proceeds is related to cyclical factors.

Changes in export proceeds due to long-term factors were at the rate of about 6 per cent a year, but the cumulative effect was often considerable.

There appeared to be a definite correlation in the rank of different commodities in respect of their year-

Table 3. Summary of Year-to-Year, Cyclical and Long-Term Fluctuations in Export Proceeds from Major Primary Commodities, 1901 to 1950

(Average percentage fluctuation per year)

Commodity	Year-to-year		Cyclical		Long-term	
	Money value	Real terms	Upswing	Downswing	Rising phase	Falling phase
Cocoa	20	24	24	23	6	4
Coffee	21	19	18	20	5	5
Copper	21	21	26	20	5	6
Cotton	26	23	25	24	6	4
Hemp	22	22	12	27	5	8
Jute	22	20	20	24	7	6
Lin-seed	28	27	24	27	6	7
Petroleum	19	19	16	11	7	6
Rice	21	23	18	17	5	3
Rubber	36	35	26	28	9	8
Silk	19	12	24	19	6	6
Sodium nitrate	22	21	26	32	5	7
Sugar	23	27	21	23	6	7
Tea	15	15	14	13	5	6
Tin	25	23	20	24	5	7
Tobacco	18	18	18	18	5	6
Wheat	33	32	42	33	8	7
Wool	15	16	16	15	4	6
AVERAGE, 18 COMMODITIES	*±22.6*	*±22.0*	*+21.7*	*−22.1*	*+5.8*	*−6.1*

to-year, cyclical and long-term fluctuations in total export proceeds. Commodities tended to be stable — or unstable — in all three respects.

Interrelation of fluctuations in price, volume and proceeds

All types of fluctuations in proceeds measured in the study — year-to-year, cyclical and long-term — and fluctuations measured for different periods, were in each case higher than those in volume or in price alone. This indicates that changes in price and in quantity had a destabilizing effect on each other. This was also found to be true in each of the sub-periods studied and with respect to the combined export proceeds of all under-developed regions and areas. In each case, fluctuations in proceeds were greater than fluctuations in price or quantity alone.

Analysis of years of falling proceeds, during which declines averaged 25 per cent, show that two-fifths of this decrease was accounted for by a drop in price, the rest by a decline in volume. For over 200 grades and varieties of commodities sold in the United States market, the decrease in price contributed less than the decline in quantity to the average drop in proceeds. The contribution of price decreases to declines in proceeds was less than one-fifth of the total — indicating that fluctuations in proceeds for specified varieties and grades were mainly determined by changes in volume.

Substantial differences were found in the relative importance of fluctuations in price and in volume, so far as particular commodities or particular countries were concerned. In general, however, neither price stabilization alone, at the existing level of instability in export volume, nor volume stabilization alone, at the existing level of instability in price, was sufficiently great to result in substantial stability of proceeds.

There was some correlation in the rank of different commodities with respect to instability of prices, instability of volume and instability of proceeds. Commodities which were particularly liable to wide year-to-year price fluctuations also tended to be liable to wide year-to-year fluctuations in volume and in proceeds, and vice versa.

An explanation of the cumulative effect of instability in prices and in proceeds, in the absence of a clear-cut correlation between the direction of changes in price and in volume, was found in the relatively greater instability of volume. Year-to-year fluctuations in volume were frequently twice as high as fluctuations in price, and thus resulted in greater instability in proceeds even when the fluctuations were in the opposite direction. Lack of clear correlation between the direction of price changes and of volume changes was in large part the result of grouping food and industrial raw materials together. In the case of food, price and volume tended to move in opposite directions; while in the case of industrial raw materials, the change was in the same direction.

Relation of fluctuations in capital inflow and invisible earnings to fluctuations in proceeds

Since the purpose of the study was to investigate "the ability of under-developed countries to obtain foreign exchange", an analysis was made of the movement of capital and of invisible earnings, in addition to changes in proceeds from exports. Data on capital movements and invisible earnings indicated that such receipts did not compensate for instability in export proceeds. Under-developed countries depend almost exclusively on foreign exchange earnings from exports for their capacity to import. Before 1939, foreign exchange receipts from long-term gross capital imports were, on the average, about 10 per cent of the foreign exchange export receipts of the six countries examined. Earnings from invisible items were about one per cent to 3 per cent of export proceeds, except where special circumstances resulted in higher proportions. During the period from 1946 to 1950, the net capital flow for investment (long-term capital), after allowing for service payments on prior capital debts, was negative for most of the under-developed countries examined. This was particularly true for the years 1946, 1947 and 1948, when many under-developed countries followed a policy of retiring foreign debts, with resumption of payments on debt service and amortization. Long-term and short-term capital inflow, combined, was generally less than 10 per cent of foreign exchange earnings from exports and showed a constantly declining trend. In a few countries, however, capital imports reached higher proportions in certain years in connexion with specific development projects or special grants. The relative importance of earnings from invisible items increased in comparison with those in the period from 1928 to 1939, chiefly because of larger income from tourist receipts.

The data show in addition that, as they were small, foreign exchange receipts from capital inflow and from invisible items failed to counteract the wide fluctuation in export proceeds. In the case of all the countries in the sample investigated, capital inflow fluctuated even more than earnings from export proceeds, particularly before 1939. Average year-to-year fluctuations in capital inflow were at least three times as wide as average year-to-year fluctuations in export proceeds — in some cases four or five times as wide. Furthermore, capital inflow and export proceeds often fluctuated in the same direction. After 1945, statistics of net long-term capital movements, as well as of total net capital flow, present an even more striking picture of year-to-year instability in capital movements, because of the inclusion of negative movements in the range of fluctuations. Invisible earnings, which are more closely linked to the volume and value of trade, followed year-to-year fluctuations in export proceeds.

Chapter 2

FLUCTUATIONS IN IMPORT UNIT VALUES OR MARKET PRICES

Fluctuations in export receipts of under-developed countries are the joint product of variations in the volume of their exports and in the prices of the commodities that enter into their export trade. Since primary commodities constitute the bulk of the exports of under-developed countries, it is the fluctuations in the price and export volume of primary commodities that chiefly affect the volume of foreign exchange receipts. In this study, fluctuations in export receipts, export volume and export prices are examined separately and their interrelations analysed. The present chapter is confined to fluctuations in prices; chapters 3 and 4 relate to fluctuations in volume and receipts, respectively, while chapter 5 examines the interrelationship among fluctuations in prices, volume and proceeds. The statistical and analytical techniques employed in the analysis of price fluctuations were also used to appraise fluctuations in export volume and receipts.

The analysis of price fluctuations covers year-to-year, cyclical, long-term and within-year variations in the prices of selected primary commodities exported to all markets, as well as a large number of subvarieties exported to a single market. The magnitude of price fluctuations during years of declining prices has also been examined separately and compared with corresponding fluctuations during years of rising prices. Since foreign exchange earnings are used largely for obtaining imports from abroad, it was also necessary to study fluctuations in the purchasing power of the foreign exchange receipts earned by under-developed countries. Analysis of price fluctuations in real terms is contained in the present chapter, while fluctuations in total export receipts in real terms are discussed in chapter 4.

Year-to-Year Fluctuations

Average year-to-year fluctuations[1] in import unit values of twenty-five major primary commodities exported by under-developed countries are shown in table 4, which also gives corresponding market price fluctuations for which data are available. Table 5 gives the average year-to-year variation in market price alone for each of forty-six selected primary commodities, inclusive of those listed in table 4. Fluctuations in import unit value are more directly related than variations in market price to the volume of foreign exchange earnings actually accruing to an under-developed country, but since import unit values are available for only a limited number of commodities, market price data have been adduced to show that market prices have the same wide year-to-year, cyclical and long-term fluctuations as import unit values.

In tables 4 and 5, commodities are listed in descending order of the year-to-year variability of their import unit values or market prices, respectively. Thus the tables show not only the relation between market price and import unit value, but also the rank of commodities according to the degree of instability in respect of import unit value or market price. The group averages shown in the two tables are unweighted arithmetic means.

A considerable degree of year-to-year fluctuation in import unit values as well as market prices is evident from these tables. As may be seen from the group average, the average fluctuation from one year to another in both cases was about 14 per cent. This means that, other things remaining equal, price fluctuations alone would cause export proceeds to fluctuate by about 14 per cent from one year to the next. Since this is an average figure, there is an even chance that the range of fluctuation would be wider than that suggested by ±14 per cent, that is, it might be above 116[2] or below 86. It is evident that such variation makes it difficult for an under-developed exporting country to determine, for even one year in advance, its ability to import goods required for economic development.

During the first half of the present century, the average fluctuation in import unit value for the twenty-five selected commodities was 13.7 per cent per year; the fluctuations ranged from a minimum of 4.7 per cent (for bananas) to a maximum of 20.7 per cent (for rubber). Fifteen of the commodities listed in table 4 registered a year-to-year fluctuation above the average, and only five recorded a variability below 10 per cent. This fact makes clear the vulnerability of the majority of primary commodities to price fluctuations.

[1] A year-to-year fluctuation is defined as the change from the average for one year to the average for the subsequent year, expressed as a percentage of the higher of the two averages.

[2] A rise from 100 to 116 represents a rise of 14 per cent of the higher point reached, that is, 116.

Table 4. Year-to-Year Fluctuations in Import Unit Values and Market Prices, 1901 to 1951

(Average percentage fluctuation per year)

Commodity	*Import unit value*	*Market price*
Rubber	20.7	20.6
Copra	19.1	16.1
Hemp	19.1	16.1
Shellac	19.0	..
Cotton	18.4	15.4
Linseed	18.2	12.7
Cocoa	16.7	16.7
Sisal	16.2	..
Jute	16.1	15.0
Wheat	15.7	11.9
Sugar	15.3	17.1
Wool	14.7	14.2
Silk	14.4	13.8
Coffee	14.3	17.2
Tin	13.9	13.3
Copper	12.5	13.8
Hides and skins	12.5	11.3
Rice	11.6	12.8
Manganese	11.3	18.7
Tobacco	10.1	18.4
Petroleum	9.7	16.3
Tea	8.8	7.1
Nickel	5.1	..
Sodium nitrate	4.9	7.3
Bananas	4.7	13.0
AVERAGE, 25 COMMODITIES	±13.7	..
AVERAGE, 22 COMMODITIES*	±13.8	±14.5

Source: See appendix A.

* For which both import unit values and market prices are shown.

The average fluctuation in market prices was about the same as that in import unit values. This was true in respect of the twenty-two commodities for which both import unit values and market prices were available (table 4). The average was about the same in respect of the forty-six commodities for which market price fluctuations are shown in table 5. For identical commodities, however, the average market price fluctuation was slightly higher than the corresponding fluctuation in import unit value. Fluctuations in market prices of all forty-six commodities also averaged slightly more than fluctuations in import unit values. The average year-to-year market price variation for the twenty-two commodities listed in table 4 was 14.5 per cent, compared with 13.7 per cent for corresponding import unit values and 14 per cent for all market prices. Fluctuations in market prices of forty-six commodities ranged from a maximum of 20.6 per cent to a minimum of 5.1 per cent — practically the same range as in the case of import unit values.[3] Thus, variations in import unit values and in market prices were similar.

[3] For the twenty-two commodities in table 4, the range was from 20.6 per cent to 7.1 per cent.

Most commodities which had higher than average fluctuations in import unit values also registered above-average fluctuations in market prices.[4] Rubber showed the greatest instability, in respect of both market price and import unit value, with an identical rate of fluctuation in both — about 21 per cent; sodium nitrate and tea were close to the bottom of the list in both cases. The rank in the case of the remaining commodities varied somewhat, however. Relatively wide market price fluctuations were often associated with smaller unit value fluctuations, and vice versa. Year-to-year variability in import unit value tended to be higher than in market price in the case of fibres but lower in the case of minerals.

In comparing market prices and import unit values it should be remembered that, while unit values usually represent the average price per unit of several sub-classifications of a particular commodity, the market price is generally the quotation for a specific variety, and the two are therefore not always strictly comparable.

Table 5 gives the relative positions of the forty-six commodities for which average market price fluctuations were available. The widest year-to-year fluctuations (more than 20 per cent) occurred in the case of rubber and pepper. Bauxite, meat, tea, sodium nitrate and quinine showed the lowest year-to-year variability (less than 10 per cent). The distribution of commodities above and below the average of the group was fairly even. The market prices of only five of the forty-six commodities recorded a low degree of fluctuation, that is, below 10 per cent, and five of the twenty-five were also under 10 per cent with respect to import unit values.

All the fibres except silk included in the list showed above-average variability, and all the cereals (barley, maize, oats, rice and wheat) below-average variability. Animal products (hides, meat and tallow) showed relatively small fluctuations. Both ground-nuts and ground-nut oil were in the above-average group. Linseed oil was also in this category, but not linseed; similarly copra was in the above-average group but not coconuts. Cotton-seed and soy-bean oil were also in the above-average group, but olive oil and palm oil in the below-average group. Among beverages, cocoa and coffee recorded above-average variability, while tea was relatively stable. Sugar and tobacco were also in the above-average group. Opium and quinine showed below-average variability; so did bananas. Some mineral products were above and some were below the average. Antimony, chrome, manganese, petroleum and tungsten were in the unstable group; bauxite, copper, lead, phosphates, platinum, sodium nitrate, tin and zinc in the more stable category.

[4] The rank of commodities in the two columns of table 4 shows a correlation of +0.34 (Spearman coefficient).

Table 5. Year-to-Year Fluctuations in Market Prices of Forty-Six Selected Primary Commodities, 1901 to 1950

(Average percentage fluctuation per year)

Commodity	Market price	Commodity	Market price
Rubber	20.6	Zinc	13.6
Pepper	20.2	Lead	13.4
Antimony	18.7	Barley	13.3
Manganese	18.7	Maize	13.3
Cotton-seed	18.4	Tin	13.3
Tobacco	18.4	Platinum	13.1
Chrome	17.6	Bananas	13.0
Ground-nut oil	17.3	Rice	12.8
Coffee	17.2	Linseed	12.7
Sugar	17.1	Olive oil	12.5
Cocoa	16.7	Opium	12.3
Ground-nuts	16.4	Phosphates	12.0
Petroleum	16.3	Wheat	11.9
Copra	16.1	Tallow	11.8
Hemp	16.1	Palm oil	11.7
Tungsten	16.0	Coconuts	11.6
Linseed oil	15.7	Hides and skins	11.3
Cotton	15.4	Oats	10.6
Jute	15.0	Quinine	8.1
Soy-bean oil	14.8	Sodium nitrate	7.3
Wool	14.2	Tea	7.1
Copper	13.8	Meat	6.3
Silk	13.8	Bauxite	5.1

AVERAGE, 46 COMMODITIES ± *14.0*

Analysis by periods

The course of price fluctuations during the fifty years covered by the analysis is shown in table 6, which gives changes in import unit values, and table 7, which gives changes in market prices, in three peace-time periods — 1901 to 1913, 1920 to 1939 and 1946 to 1951 — and two war periods — 1914 to 1919 and 1940 to 1945. The average of year-to-year fluctuations is shown for each period, for both import unit values and market prices.

In the peace-time periods year-to-year price fluctuations tended to increase, from an average of about 11 per cent during 1901 to 1913, and 15 per cent during 1920 to 1939, to 18 per cent in 1946 to 1951 (table 6). On the other hand, from the first war period to the second, price variations lessened considerably. The results are almost identical for import unit values and for market prices. Thus it appears that, in peace time, price fluctuations tended to become somewhat greater while, in war time, prices were more stable and more strictly controlled.

In the case of jute and sodium nitrate, fluctuations in import unit values in 1920 to 1939 were less wide than during 1901 to 1913; in both, the reduction in instability was very small. For the majority of commodities, fluctuations have increased still further during the post-war period. Those which showed the most marked increase in variability during 1946 to 1951 were cotton, hemp, silk and sisal among fibres; nickel, sodium nitrate and tin among mineral products; and bananas, cocoa, coffee, copra and rice among food products. The variability of copper, jute, linseed, petroleum and wheat prices also increased, but to a lesser degree. Commodities which showed reduced fluctuations during 1946 to 1951 were hides and skins, manganese, rubber, shellac, sugar, tea, tobacco and wool. There were more cases of reduction in fluctuations for the period 1946 to 1951 compared with 1920 to 1939 than had been the case in the latter period compared with the period 1901 to 1913, and the reductions were greater; in half of the cases, the reduction was very pronounced (for example, in respect of sugar, tea, tobacco and wool).

Most of the commodities followed the general pattern of a reduction in fluctuations in import unit values between the first war period and the second. The exceptions were copra, linseed, petroleum, silk and, particularly, rice and tea.

Only one commodity, copra, had year-to-year fluctuations which increased progressively during all five periods — from 13.7 per cent in the period from 1901 to 1913 to 35.0 per cent in 1946 to 1951. Silk came very close to being included in this category.

Table 6. Year-to-Year Fluctuations in Import Unit Values, by Periods

(Average percentage fluctuation per year)

Commodity	Period	Peace-time period			War period		Full period
		1901 to 1913	1920 to 1939	1946 to 1951	1914 to 1919	1940 to 1945	
Rubber	1901 to 1951	12.4	29.3	24.9	15.4	10.0	20.7
Copra	1907 to 1951	13.7	17.0	35.0	15.3	19.2	19.1
Hemp	1901 to 1951	10.9	22.0	33.7	16.7	13.4	19.1
Shellac	1904 to 1951	17.2	20.2	15.1	23.7	17.9	19.0
Cotton	1901 to 1951	13.4	15.9	33.0	23.1	17.4	18.4
Linseed	1901 to 1950	14.2	17.3	21.8	17.3	27.0	18.2
Cocoa	1901 to 1951	10.2	18.1	33.1	13.4	12.1	16.7
Sisal	1909 to 1951	6.0	18.3	20.4	14.6	13.1	16.2
Jute	1901 to 1951	15.7	14.6	17.7	25.2	10.0	16.1
Wheat	1901 to 1951	15.5	15.7	17.0	18.3	12.6	15.7
Sugar	1901 to 1951	13.4	20.2	8.4	16.3	8.7	15.3
Wool	1901 to 1948	12.2	18.2	11.9	16.1	7.8	14.7
Silk	1901 to 1951	5.9	16.3	23.1	15.3	16.1	14.4
Coffee	1901 to 1951	9.3	14.3	23.4	17.4	11.9	14.3
Tin	1901 to 1951	11.0	17.3	19.5	13.8	2.5	13.9
Copper	1901 to 1951	11.6	14.3	15.9	15.2	2.3	12.5
Hides and skins	1901 to 1951	5.3	15.9	14.5	18.6	8.0	12.5
Rice	1901 to 1951	2.0	9.7	18.8	11.3	30.0	11.6
Manganese	1920 to 1951	..	13.0	8.1	..	8.5	11.3
Tobacco	1901 to 1951	7.8	10.9	5.7	15.5	11.3	10.1
Petroleum	1912 to 1951	21.0	10.9	11.2	3.7	8.3	9.7
Tea	1901 to 1951	5.1	12.1	6.3	5.6	11.3	8.8
Nickel	1920 to 1951	..	4.8	9.5	..	1.5	5.1
Sodium nitrate	1901 to 1951	6.3	5.7	10.3	11.0	4.3	4.9
Bananas	1920 to 1951	..	3.7	7.2	..	5.0	4.7
AVERAGE, 25 COMMODITIES		*±10.9*	*±15.0*	*±17.8*	*±15.6*	*±11.6*	*±13.7*

Most commodities also followed the general pattern of increased fluctuations in market prices during the peace period 1920 to 1939, compared with 1901 to 1913. The few exceptions were antimony, cotton-seed, linseed, linseed oil, opium and quinine. Similarly, for most commodities, fluctuations increased during 1946 to 1951 compared to 1920 to 1939, but the exceptions were larger in number and more pronounced.

Similarly, most market prices, as in the case of import unit values, declined in variability during the Second World War compared to the previous war period. The exceptions were bananas, barley, bauxite, cocoa, coconuts, palm oil, and soy-bean oil. Fluctuations in market prices did not increase progressively throughout the entire period in the case of any commodity.

In general, year-to-year fluctuations in commodity prices, whether measured in market prices or import unit values, were greater during the First World War, compared with the period from 1901 to 1913, but declined during the inter-war period (1920 to 1939), though not to the same level as before. The fluctuations were even smaller during the Second World War but in most instances increased in magnitude during the period 1946 to 1951 — in some cases to record levels.

Analysis of subvarieties of commodities exported to the United States market

Year-to-year fluctuations in United States import unit values were computed for a larger number of primary commodities, consisting of narrowly defined subvarieties of commodities exported by under-developed countries to the United States. In computing fluctuations in import unit value, an effort was made to include commodities which were homogeneous according to grade, description and other characteristics, in order that the import unit values might approximate true price quotations as closely as possible. Selection of items exported from individual under-developed countries was limited to exports with a total value of at least $1 million in 1949, provided unit value data were available for a sufficient number of earlier years. Where a major reclassification or a change in description or in customs procedure intervened, year-to-year fluctuations were not computed. Thus, 218 items were analysed for varying periods ending in 1949; these covered 111 of a possible total of 154 commodities. In addition, for 175 of the 218 items, data were analysed for varying periods ending in 1939 (see table I in appendix D).

The simple average of year-to-year variations in unit values for the 175 items was 16.8 per cent,[5] both for

[5] About 18 per cent on the conventional measure.

Table 7. Year-to-Year Fluctuations in Market Prices, by Periods

(Average percentage fluctuation per year)

Commodity	Period	Peace-time period			War period		
		1901 to 1913	1920 to 1939	1946 to 1950	1914 to 1919	1940 to 1945	Full period
Bananas	1913 to 1949	..	8.8	10.2	22.7	24.9	13.0
Cocoa	1913 to 1947	..	13.8	48.9	15.8	16.7	16.7
Coffee	1901 to 1949	14.4	21.3	17.6	17.1	8.6	17.2
Copper	1901 to 1949	13.1	15.5	17.5	19.7	1.2	13.8
Copra	1913 to 1939	..	17.0	..	12.9	..	16.1
Cotton	1901 to 1947	10.1	14.9	18.0	24.2	18.3	15.4
Hemp	1901 to 1947	12.6	15.7	23.3	27.8	9.2	16.1
Hides and skins	1901 to 1950	5.7	13.8	18.9	10.5	8.4	11.3
Jute	1901 to 1948	14.9	16.0	25.3	16.6	10.1	15.0
Linseed	1901 to 1948	12.4	11.1	18.7	16.5	12.2	12.7
Manganese	1913 to 1937	..	15.0	..	29.9	..	18.7
Petroleum	1913 to 1947	..	18.5	20.4	24.6	2.9	16.3
Rice	1901 to 1949	9.2	13.0	16.1	17.2	12.6	12.8
Rubber	1901 to 1949	20.5	28.0	11.5	12.4	10.3	20.6
Silk	1901 to 1947	8.8	15.4	46.8	15.4	6.3	13.8
Sodium nitrate	1901 to 1949	4.3	5.9	7.1	15.7	9.5	7.3
Sugar	1901 to 1948	12.2	23.6	11.4	18.0	9.0	17.1
Tea	1901 to 1948	4.1	7.7	14.3	8.1	6.0	7.1
Tin	1901 to 1949	9.4	15.9	15.4	19.4	4.6	13.3
Tobacco	1913 to 1947	..	19.0	1.0	20.8	17.2	18.4
Wheat	1901 to 1950	5.7	15.3	9.8	14.0	12.9	11.9
Wool	1901 to 1949	5.6	16.9	21.7	23.6	8.0	14.2
AVERAGE, 22 COMMODITIES[a]		*±10.2*	*±15.5*	*±18.7*	*±18.3*	*±10.4*	*±14.5*
Antimony	1901 to 1945	19.1	19.0	..	31.8	4.2	18.7
Barley	1901 to 1950	6.8	13.3	4.7	17.5	29.6	13.3
Bauxite	1918 to 1948	..	3.4	4.6	3.4	12.9	5.1
Chrome	1913 to 1937	..	11.3	..	36.6	..	17.6
Coconuts	1913 to 1949	..	12.7	..	7.0	16.9	11.6
Cotton-seed	1901 to 1949	21.3	17.9	22.7	19.9	12.4	18.4
Ground-nut oil	1916 to 1946	..	19.0	1.0	15.7	15.0	17.3
Ground-nuts	1913 to 1949	..	15.7	5.3	21.3	20.8	16.4
Lead	1901 to 1949	10.7	15.8	25.3	9.4	7.3	13.4
Linseed oil	1901 to 1950	16.5	14.3	23.7	14.9	12.8	15.7
Maize	1901 to 1950	8.3	16.8	14.4	17.6	6.6	13.3
Meat	1901 to 1950	4.5	6.5	7.1	10.9	4.1	6.3
Oats	1901 to 1950	7.3	12.0	5.6	15.8	11.4	10.6
Olive oil	1901 to 1950	6.5	14.7	14.4	18.0	10.0	12.5
Opium	1901 to 1949	11.2	9.1	9.0	31.1	6.7	12.3
Palm oil	1901 to 1950	6.8	13.0	13.0	13.0	15.3	11.7
Pepper	1901 to 1949	9.0	26.4	39.1	16.3	13.3	20.2
Phosphates	1913 to 1949	..	12.5	12.7	12.7	9.3	12.0
Platinum	1913 to 1949	..	14.7	22.4	13.0	1.5	13.1
Quinine	1901 to 1949	10.4	5.6	1.9	18.2	6.0	8.1
Soy-bean oil	1913 to 1949	..	14.4	15.0	12.3	22.3	14.8
Tallow	1901 to 1949	7.9	12.8	7.4	16.6	14.3	11.8
Tungsten	1913 to 1949	..	16.0	9.0	32.7	4.1	16.0
Zinc	1901 to 1949	10.9	14.5	22.1	16.6	7.2	13.6
AVERAGE, 46 COMMODITIES		*±10.3*	*±14.6*	*±16.0*	*±17.9*	*±11.0*	*±14.0*

[a] Commodities for which both import unit values and market prices were available.

the period ending in 1939 and for the full period ending in 1949. The average for the 218 items was slightly higher — 17.3 per cent.[6] Thus, on the whole, average year-to-year fluctuations for these commodities were about 17 per cent. This high degree of instability applied not only to the war and to the post-war period, when there was a long-term rising price movement, but equally to the period ending in 1939, when there was no marked secular trend. This 17 per cent year-to-year fluctuation is not far from the 14 per cent obtained for the principal primary commodities considered earlier in this chapter (see table 4). The frequency distribution of year-to-year fluctuations in unit values of exports to the United States is shown in table 8.

Table 8. Frequency Distribution of Year-to-Year Fluctuations in Import Unit Values of Exports to the United States

	Period ending in 1939		Period ending in 1949	
Average percentage fluctuation per year	Number of items	Per cent of total	Number of items	Per cent of total
0 to 4.9	2	1.1	—	—
5 to 9.9	25	14.3	18	8.3
10 to 14.9	40	22.9	64	29.4
15 to 19.9	52	29.7	79	36.2
20 to 24.9	38	21.7	37	17.0
25 to 29.9	12	6.9	13	6.0
30 and over	6	3.4	7	3.2
TOTAL	175	100.0	218	100.0

Only two items of the 175 covered for the period ending in 1949, there was no item of the 218 included year price variation (under 5 per cent); for the period ending in 1949, there was no item of the 218 included which had an average year-to-year fluctuation below 5 per cent. The next group of items, with average fluctuations between 5 and 9.9 per cent, which can be considered "reasonably stable", constituted only about 14.3 and 8.3 per cent of the total number of items for the two periods, respectively. In the next higher group, consisting of items with average year-to-year fluctuations between 10 and 14.9 per cent, were about one-fifth of the number of items in the period ending in 1939, and 29 per cent of the total number of items during the period ending in 1949. Nearly two-thirds of the items showed year-to-year fluctuations of 15 per cent or over. The significance of this fact for the under-developed areas is obvious. All these figures would, of course, be higher if the conventional measure had been used.

For the 175 items for which the periods ending in 1939 and in 1949 could be compared, average year-to-year fluctuations appear to have been about the same in the two periods; there were 87 cases — or almost half — in which the average variation during the period ending in 1949 was greater than in the period ending in 1939, in three it was the same, and in the remaining cases it was less.

Table 9 summarizes average year-to-year unit value fluctuations experienced by under-developed countries in respect of their exports to the United States. The various subvarieties of commodities included as separate items among the 218 series analysed have been weighted according to their relative value in the country's exports to the United States in 1949. Countries are listed in table 9 in descending order of sensitiveness of their export items to year-to-year fluctuations in unit value. The experience of different countries varies greatly, ranging from a variation of 33 per cent in the case of Bolivia, whose economy is largely dominated by the instability of tin prices, to an average of less than 10 per cent for Costa Rica. The year-to-year fluctuations in export unit value experienced by different countries represent as wide a range of variation as the fluctuations among different commodities.

Table 9. Year-to-Year Fluctuations in Import Unit Values of Exports to the United States, by Country, 1922 to 1949

Country	Number of separate series	Per cent of fluctuation in unit value*	Average year-to-year decrease in unit value*
Bolivia	4	33.0	30.6
Gold Coast	4	22.7	29.4
Indonesia	7	21.4	24.9
Malaya	3	21.2	21.0
Philippines	7	20.9	20.7
Dominican Republic	8	19.9	20.1
China	11	18.2	18.3
India and Pakistan	17	18.2	16.1
Peru	6	18.1	17.7
Brazil	15	16.1	16.0
Argentina	13	16.0	19.2
Cuba	15	15.8	14.6
Mexico	23	15.1	11.3
Chile	4	14.9	16.4
Venezuela	4	12.3	11.0
Costa Rica	4	9.7	8.4

* For each country, the average is weighted according to relative value of exports of each item to the United States in 1949.

For countries exporting at least ten of the items, the extent of fluctuation in prices was determined for the period ending in 1949. These calculations form the basis of the discussion which follows.

In the case of Argentina, the three most sensitive commodities were casein, carpet wool (greasy basis) and sheep or lamb fur (undressed), all fluctuating in price by more than 23 per cent. Canned beef, quebracho and Romano cheese were the most stable, all fluctuating by less than 13 per cent. In general, Argentine food exports were more stable than other exports from Argentina.

[6] About 19 per cent on the conventional measure.

Among Brazilian exports, iron ore and unshelled Brazil-nuts underwent heavy price fluctuations (over 24 per cent), while canned beef and manganese ore were more stable in price (under 12 per cent). The price of shelled Brazil-nuts was much more stable than that of unshelled Brazil-nuts, indicating increased stability in price as a result of processing. Coffee was among the more stable articles, fluctuating by 15 per cent on the average.

For China, carpet wool, feathers and weasel fur (undressed) fluctuated in price by 20 per cent or more; prices of bristles, tin bars and tung oil were more stable, but even these fluctuated by about 17 per cent.

In the case of Cuba, prices of cane sugar, molasses, preserved pineapples and sisal fluctuated by over 19 per cent; three commodities — bananas, tobacco filler and crated pineapples — fluctuated by less than 10 per cent in price. Of the different kinds of cane sugar listed, the most important, 96°, showed much greater sensitivity to export price fluctuations than 100° or 97° cane sugar. Similarly, tobacco filler, tobacco scrap and tobacco wrappers showed significant differences.

Among exports from India to the United States, black pepper, reptile and shark leather and shellac were very unstable in price, fluctuating by over 23 per cent; on the other hand, cashew nuts, jute burlap, tea and, particularly, manganese ore were relatively stable and fluctuated by less than 14 per cent. Jute bagging and jute burlap were significantly more stable in price than unmanufactured jute.

Among exports from Mexico, manganese ore and molasses fluctuated most in price (over 25 per cent); bananas, chicle and tomatoes were most stable (fluctuations of 10 per cent or less). Of the metals, lead and zinc prices fluctuated by about 18 per cent, but copper concentrates were distinctly more stable.

In the case of the Philippines, copra, copra oilcake and preserved pineapples fluctuated by over 20 per cent, coconut meat and 96° cane sugar by under 13 per cent.

From the more detailed study, it appears that year-to-year unit value fluctuations for subvarieties of commodities were more pronounced than those for the broadly defined primary commodities. For the latter, the average year-to-year fluctuations were about 14 per cent; for the subvarieties of commodities sold in the United States market, fluctuations averaged 17 per cent. While part of the difference may be attributed to the different period covered, it appears that the narrowly defined specific subvarieties of a commodity are more vulnerable to fluctuation than the general commodity classification. In addition to the general forces of instability which affect the broader categories, the prices of subvarieties are affected by market conditions peculiar to them.

An analysis has also been made of the commodity series included in the larger sample, to show differences between individual commodities. Among groups of commodities, foods, beverages and tobacco had significantly lower price fluctuation than the average, minerals had average price fluctuations, while textile fibres and other industrial raw materials showed vulnerability above the average. The relative positions of the major individual commodities included in the larger sample are shown in table 10. The rank of different commodities in this table agrees closely with that obtained by previous calculations.[7] Bananas, petroleum and tea again appear among the stable commodities; cotton, hemp, pepper and rubber among the less stable.

Table 10. Year-to-Year Fluctuations in Import Unit Values of Exports to the United States, by Commodity, 1922 to 1949

Commodity	*Number of items*	*Per cent of fluctuation in unit value*[a]	*Average year-to-year decrease in unit value*[a]
Pepper	3	26.0	26.0
Tin	4	24.0	23.0
Cocoa and cocoa beans	10	22.4	25.0
Rubber	6	22.3	23.7
Hemp	5	18.6	19.9
Hides and skins	9	18.2	22.1
Lead	7	18.1	15.8
Sisal and henequen	5	16.4	17.5
Cotton	4	16.3	19.4
Wool	9	16.1	21.6
Cane sugar	6	15.6	13.9
Copper	8	14.6	15.8
Coffee	15	14.4	14.6
Manganese	6	14.1	10.5
Petroleum	7	13.6	11.0
Tea	4	12.9	11.5
Tobacco	9	11.8	11.3
Beef	5	10.5	16.1
Bananas	11	8.1	6.9

[a] Weighted according to relative value of items included under each commodity.

Regional pattern of fluctuations in prices of exports to the United States

The preceding data described fluctuations in the United States import unit values of narrowly defined varieties of primary commodities exported by individual under-developed countries. An analysis[8] of total United States imports, by region of origin, for the period 1923 to 1939, covering imports from all coun-

[7] See tables 4 and 5.

[8] The data utilized were based on material contained in J. H. Adler, E. R. Schlesinger and E. Van Westerborg, "Indexes of United States Imports by Geographical Areas and Commodity Classification, 1923-1949" published in 1952 under the title, *Pattern of United States Import Trade since 1923* (Federal Reserve Bank, New York).

tries, with separate data on United States imports from Latin America, from the oversea sterling area,[9] and from a group of under-developed countries outside Latin America and outside the sterling area,[10] shows the following average year-to-year fluctuations:

Exporting region	*1923 to 1939*
All exports	8.3
Under-developed areas:	
Latin America	9.0
Oversea sterling area	18.3
Other under-developed countries	10.0

Average year-to-year fluctuations in unit values with respect to broad categories and areas, including all classes of commodities, appear on the whole somewhat smaller than in the case of individual commodities. This is to be expected, since some of the changes are compensatory in nature; not all commodities move in the same direction at the same time. While this tends to lessen the impact of price fluctuations for under-developed regions considered as a whole, it does not provide relief for the individual under-developed country, which usually depends on one or two staple commodities for export. The data also show that, even if all classes of commodities for a whole region are combined, the resulting fluctuations are still exceedingly high for at least one major under-developed region — the oversea sterling area. Moreover, fluctuations in prices of exports of under-developed regions are distinctly higher than those for United States imports from all sources.

Cyclical Movements

A conspicuous feature of commodity price movements during the first half of the twentieth century was the magnitude of cyclical variations. While the year-to-year fluctuations in prices were large in themselves, as indicated in the preceding section, the degree of instability was heightened by the fact that prices tended to move in the same direction for several successive years. For this reason, measurement of year-to-year fluctuations alone understates the degree of instability. Although the timing, duration and amplitude of cyclical movements varied from commodity to commodity, there was a strong tendency for prices to fluctuate together.

The cyclical movements in commodity prices have been measured by eliminating from individual price movements the effect of long-term secular trends. Elimination of these influences is necessary because secular trends tend to distort the true magnitude of cyclical variations. Upward secular trends exaggerate the rise of prices during the expansion phase of a short-term cyclical movement and minimize the downswing during the contraction phase of the cycle. Downward secular trends have the opposite effect.

Table 11, which summarizes the cyclical movements in import unit values for twenty-five commodities, shows that in the upswing (after elimination of secular trends), unit values rose about 26 per cent,[11] or, measured on an annual basis, by an average of approximately 13 per cent per year. In the downswing, unit values fell about 26 per cent from the high point — an average of 13 per cent per year.[12] The amplitude of the cyclical swing in unit values of primary commodities, as may be seen from table 11, was considerably greater than the changes in the general wholesale price indices of the United States and the United Kingdom.

An average cyclical variation in import unit values of 26 per cent means that, on an average, a given primary commodity experienced a price fluctuation from 74 to 100 and back again to 74, all within a little over four years, with an even possibility that actual changes were outside these limits. These variations were in addition to long-term, random or seasonal fluctuations.

If the total amplitude of cyclical changes is considered, only three of the twenty-five commodities (bananas, nickel, and manganese) showed cyclical variations of less intensity than the United States wholesale price index during the upswing, and the same three showed smaller total amplitude of cyclical movements during the downswing. On an average, cyclical fluctuations in primary commodities were

[9] This group included the following countries: Aden, Australia, Bahamas, Bahrein, Barbados, Bermuda, British East Africa, British Guiana, British Honduras, British Oceania, British Somaliland, Burma, Ceylon, Cyprus, Falkland Islands, Gambia, Gibraltar, Gold Coast, Gozo, Hong Kong, India, Iraq, Jamaica, Kuwait, Leeward and Windward Islands, Malaya, Malta, Mauritius and dependencies, New Guinea, New Hebrides, New Zealand, Nigeria, Northern and Southern Rhodesia, Pakistan, St. Helena, Seychelles and dependencies, Sierra Leone, Trinidad and Tobago and Union of South Africa. Certain British territories in southern and western Africa not elsewhere specified were included.

[10] This group included the Aegean Islands, Afghanistan, Algeria, Anglo-Egyptian Sudan, Angola, Arabian Peninsula, Azores, Belgian Congo, Cameroon, Canary Islands, Cape Verde Islands, China, Egypt, Eritrea, Ethiopia, Formosa, French Equatorial Africa, French Guiana, French Pacific Islands, French Somaliland, French West Africa, French West Indies, Greenland, Indochina, Indonesia, Iran, Japan, Japanese mandated islands, Jordan, Korea, Kwantung, Lebanon, Liberia, Libya, Madagascar, Madeira, Manchuria, Morocco, Mozambique, Netherlands Antilles, Netherlands Indies, Palestine, Philippines, Portuguese Asia, Portuguese Guinea, St. Pierre and Miquelon, Somalia, southern and southeastern Asia, Spanish Africa, Surinam, Syria, Tangier, Thailand and Tunisia.

[11] Measured in relation to the high point subsequently reached. It is equivalent to a rise of 37 per cent from the low point as measured conventionally.

[12] The average duration of the upswing or downswing was about two and a quarter years, and of the complete cycle about four and one-half years.

Table 11. Cyclical Movements in Import Unit Values, 1901 to 1951

Commodity[a]	Upswing				Downswing			
	Number of upswings	Total duration (years)	Percentage increase		Number of downswings	Total duration (years)	Percentage decrease	
			Total amplitude[b]	Rate per year			Total amplitude[c]	Rate per year
Hemp	9	23	37.6	15.0	8	21	41.2	16.4
Cotton	8	23	42.5	16.3	8	19	39.9	18.6
Copra	8	22	36.3	14.8	7	16	37.3	16.2
Cocoa	9	23	37.6	15.7	8	19	36.4	17.5
Linseed	10	23	39.9	18.7	9	21	34.3	15.0
Rubber	8	20	38.1	17.6	9	22	32.9	14.5
Shellac	10	19	32.2	22.0	10	23	31.5	14.6
Coffee	8	19	32.8	18.2	9	24	31.3	12.9
Wool	9	20	30.3	13.7	9	21	29.2	12.7
Tin	10	26	26.1	10.9	9	20	28.5	14.0
Rice	10	19	25.5	13.0	10	22	28.0	16.0
Jute	12	25	20.4	14.4	11	18	27.8	20.2
Sisal	8	17	32.9	15.0	9	17	27.0	12.2
Silk	11	23	24.8	12.0	11	19	26.6	21.1
Copper	11	21	25.9	14.3	10	23	24.6	11.2
Wheat	11	18	24.3	14.9	11	23	23.4	11.3
Petroleum	7	18	21.6	9.2	6	15	21.9	8.7
Sugar	12	21	22.3	12.2	13	22	20.8	13.6
Hides	12	23	21.7	12.2	12	22	19.6	12.8
Tobacco	10	24	20.8	10.3	9	19	19.5	9.9
Tea	9	22	18.6	8.0	8	21	19.2	10.5
Sodium nitrate	9	26	17.9	6.4	8	18	18.6	8.6
Manganese	6	12	11.1	5.5	6	13	10.7	5.6
Bananas	6	13	6.0	2.8	6	12	5.8	3.0
Nickel	6	9	6.2	3.5	6	16	5.1	2.9
Average, 25 commodities	*9.2*	*20.4*	*26.1*	*12.7*	*8.9*	*19.4*	*25.6*	*13.0*
Wholesale price index:								
United States	9	22	13.7	5.2	10	16	12.0	7.6
United Kingdom	7	27	19.2	5.8	7	14	18.6	9.2

[a] Arranged in descending order of total amplitude of decrease during downswings.

[b] Increase from low point as a percentage of the high point.
[c] Percentage decrease from high point.

about twice as high as fluctuations in the United States wholesale price index, and about half as much again as in the United Kingdom wholesale price index.

The commodities with the greatest amplitude of cyclical upswing were cocoa, cotton, hemp, linseed and rubber, with total increases of nearly 40 per cent; this is equivalent to an increase of 60 to 70 per cent, as measured from the low point by the more conventional method. Perhaps even more significant was the amplitude of cyclical downswings. Here, again, three of the same commodities, cocoa, cotton and hemp, had high cyclical downswings, of close to 40 per cent; copra was close to this average also, but linseed and rubber had slightly smaller downswings. The cyclical downswing of 40 per cent meant that in the average trade cycle, such commodities as cocoa, copra, cotton and hemp tended to fall from the high point of 100 to a low point near 60. It should be emphasized that this represented the average experience of the exporters of such commodities.

Commodities in which total cyclical downswings exceeded 30 per cent included hemp, cotton, copra, cocoa, linseed, rubber, shellac and coffee. The major textile fibres had above-average cyclical downswings, as did cocoa, coffee and rubber. Most of the minerals and foodstuffs had smaller cyclical downswings.

Also significant, apart from the total amplitude of cyclical fluctuations, was the annual rate or steepness of the cyclical downswing. The commodities with the greatest annual declines during cyclical downswings were jute and silk — each over 20 per cent per year; the decline in cotton was not much smaller. The three commodities with the greatest annual rates of cyclical decline were thus all textile fibres. The rate of annual decrease in import unit value during the cyclical downswing was less than 10 per cent in only six of the twenty-five commodities. These included minerals such as manganese, nickel, petroleum and sodium nitrate, together with bananas and tobacco. The difference in

Table 12. Cyclical Movements in Market Prices, 1901 to 1950

Commodity[a]	Upswing				Downswing			
	Number of upswings	Total duration (years)	Percentage increase: Total amplitude[b]	Percentage increase: Rate per year	Number of downswings	Total duration (years)	Percentage decrease: Total amplitude[c]	Percentage decrease: Rate per year
Coffee	7	21	43	15	8	19	42	18
Cotton	6	19	41	13	7	20	41	14
Linseed oil	7	27	40	12	7	16	39	19
Pepper	10	20	33	22	9	22	39	18
Sugar	8	20	37	16	8	19	39	16
Copper	7	22	36	12	7	19	37	14
Cocoa	8	20	34	15	8	18	36	16
Ground-nut oil	5	11	37	15	6	16	36	14
Manganese	5	10	27	12	4	8	36	29
Soy-bean oil	6	15	37	15	5	11	36	15
Tin	6	19	36	13	6	23	36	9
Antimony	10	18	32	16	9	20	34	16
Cotton-seed	10	23	41	18	10	19	34	21
Petroleum	9	15	23	16	9	13	33	23
Copra	4	9	30	14	4	11	32	18
Rubber	11	21	35	24	11	20	32	18
Jute	9	19	30	16	9	20	31	14
Wool	9	21	29	13	9	21	31	17
Lead	10	19	29	17	9	23	30	14
Linseed	8	26	30	10	8	15	29	15
Maize	9	25	27	10	9	18	28	17
Tungsten	8	11	24	17	8	18	27	18
Zinc	10	22	26	17	10	20	27	16
Barley	11	21	23	12	11	21	25	12
Silk	10	19	24	14	10	19	25	13
Tallow	9	19	27	14	9	22	25	10
Bananas	6	13	30	12	5	13	24	11
Chrome	7	10	22	17	6	7	24	23
Ground-nuts	8	15	31	15	8	12	24	21
Phosphates	6	14	23	10	7	16	24	17
Rice	10	21	24	13	10	21	24	12
Hemp	12	20	22	12	12	19	23	15
Olive oil	12	23	25	12	11	20	23	11
Opium	10	19	23	13	9	23	23	9
Coconut	7	13	20	11	6	11	22	11
Palm oil	11	21	20	11	11	21	22	12
Tobacco	8	17	19	10	8	20	21	18
Hides	11	24	21	11	10	19	20	10
Platinum	8	15	19	12	8	16	20	11
Oats	13	21	17	13	12	22	18	10
Wheat	10	22	27	10	11	21	17	8
Bauxite	6	18	13	4	5	9	14	11
Quinine	10	17	14	10	10	25	14	7
Tea	8	17	13	6	8	24	14	5
Sodium nitrate	10	19	12	5	10	23	13	6
Meat	12	20	9	5	12	22	9	5
Average, 46 commodities	*8.6*	*18.5*	*26.8*	*13.0*	*8.5*	*18.2*	*27.2*	*14.3*
Average, market prices, 22 commodities[d]	*8.3*	*18.8*	*28.3*	*12.8*	*8.3*	*18.4*	*28.9*	*14.5*
Average, import unit values, 22 commodities[d]	*9.3*	*21.1*	*26.5*	*12.6*	*9.0*	*19.5*	*26.3*	*13.2*

[a] Arranged in descending order of total amplitude of decrease during downswings.
[b] Increase from low point as a percentage of the high point.
[c] Percentage decrease from high point.
[d] Commodities for which both import unit values and market prices were available.

stability between textile fibres at one extreme and minerals at the other was again marked.

Annual rates of fluctuation in unit value during cyclical upswings were similar to those during downswings, except that during the upswing tea was among the stable commodities with changes of less than 10 per cent per year, while variations in tobacco prices were at an annual rate of slightly more than 10 per cent. Shellac had the greatest annual increase to the high point of the cycle — 22 per cent — with coffee, linseed and rubber all fluctuating more than 17.5 per cent. The textile fibres, which showed the largest annual declines in cycles, did not have the largest annual rises in the upswing. Their upswings tended to be more gradual and prolonged, their declines steeper and more abrupt.

Among beverages, cocoa and coffee registered a high degree of variability, but tea was in the group of relatively stable commodities. Of the two cereals in the list — rice and wheat — the former recorded relatively larger variability. Other agricultural products like copra, linseed and rubber registered high degrees of variability. Shellac, a forest product, also registered high cyclical instability. Tobacco and bananas, particularly the latter, had relatively low cyclical variability. In general, mineral products included in the table registered relatively low fluctuations and rarely figured among commodities with above-average total or annual cyclical variability. Their total cyclical variability averaged about 18 per cent (about 8 points below the average for all commodities), while their rate of annual variation averaged about 9 per cent as compared with 13 per cent for all the commodities in the table. Among minerals, copper and tin were less stable than manganese, nickel and petroleum, especially the first two.

Table 12 summarizes the cyclical movements in the market price of each of forty-six commodities. Average cyclical fluctuations, whether expressed as total amplitude or in annual rates, tended to be a little higher in respect of both upswings and downswings, than corresponding fluctuations in the unit value. The relative positions of individual commodities listed in both tables were substantially different in several cases, depending on whether market prices or unit values were considered. The magnitude of total cyclical fluctuation during the downswing was similar for both prices and unit values in the case of cocoa, cotton, hides, jute, rubber, silk, tobacco and wool. It was significantly higher for market prices in the case of bananas, coffee, copper, manganese, petroleum, sugar and tin, and it was significantly lower in the case of copra, hemp, linseed, sodium nitrate and tea, and was also lower in the case of rice and wheat. Outstanding differences occurred in the case of minerals, sugar and bananas. Of the additional commodities in table 12 — those for which only market prices were available — antimony, cotton-seed, ground-nut oil, lead, linseed oil, maize, pepper and soy-bean oil were above the average in cyclical instability. Their annual rate of cyclical fluctuation was also generally above the average. Commodities with relatively low (14 per cent or less) total cyclical variability were bauxite, meat and quinine.

The data indicate, in general, that: (1) Cyclical movements in commodity prices were considerable, and averaged more than 25 per cent of the high point[13] in either direction (from the preceding low point to the succeeding high point and from the preceding high point to the succeeding low point). The annual rate of such fluctuation was about 13 per cent — almost as high as the year-to-year price variations of about 14 per cent. To this extent, therefore, year-to-year fluctuations were almost entirely determined by cycles. (2) The degree of cyclical change was practically the same for import unit values and market prices, whether unit values and market prices for the same group of commodities were compared or a larger group of market prices was considered. (3) Import unit values and market prices for the same commodities tended to have a similar degree of cyclical instability. There were, however, notable exceptions to this, especially in the case of minerals and sugar (which registered conspicuously higher market price fluctuations), and of hemp and linseed (which had lower market price fluctuations).

Long-Term Trends

In the unit value and market price data collected for this study, long-term trends were measured by a seven-year moving average. Changes in this seven-year moving average itself constituted the "long-term trend"; deviation of the data from the moving average was the basis for computing the cyclical fluctuations discussed in the preceding section.

Table 13 shows the duration and amplitude of long-term secular movements during the first half of the twentieth century. Similar information relating to market prices of a larger number of commodities is summarized in table 14. The latter includes twenty-two of the twenty-five commodities listed in table 13. Table 15 compares commodities in respect of the duration and amplitude of long-term price trends.

At the opening of the century, prices and unit values of the majority of commodities were moving in an upward direction, the tempo increasing markedly during the second decade. The third decade saw a general

[13] Equivalent to 33 per cent of the low point.

downward swing that lasted until about the mid-thirties. The trend since then has again been in an upward direction, particularly strong during 1946 to 1950.

Table. 13. Long-Term Trends in Import Unit Values, 1901 to 1951

Commodity	Rising phase: Number of years	Rising phase: Average percentage increase per year	Falling phase: Number of years	Falling phase: Average percentage decrease per year
Bananas	19	0.8	6	1.5
Cocoa	20	4.5	24	3.8
Coffee	31	4.8	11	5.5
Copper	19	4.6	22	4.0
Copra	18	5.9	19	3.9
Cotton	24	5.4	14	4.9
Hemp	21	6.2	19	2.8
Hides and skins	23	5.8	21	4.0
Jute	35	4.4	8	6.6
Linseed	23	6.3	16	4.3
Manganese	18	4.3	7	2.6
Nickel	11	3.3	14	0.9
Petroleum	20	5.7	12	4.3
Rice	25	2.8	12	4.3
Rubber	19	4.9	19	7.1
Shellac	18	8.8	23	5.8
Silk	16	5.6	23	6.4
Sisal	22	5.2	14	5.0
Sodium nitrate	18	4.1	24	3.0
Sugar	32	4.3	11	6.0
Tea	36	3.0	8	4.6
Tin	34	3.3	7	4.0
Tobacco	22	5.5	17	4.0
Wheat	16	4.3	17	4.2
Wool	26	3.5	13	4.7
AVERAGE, 25 COMMODITIES	*22.6*	*4.7*	*15.2*	*4.3*

During the first half of the twentieth century the long-term secular movement of prices of primary commodities (in respect of both import unit value and market price) resulted in an average annual rate of increase of 4.5 to 4.7 per cent during the rising phases, and an annual rate of decline of 4.3 to 4.4 per cent during the falling phases. As might be expected, the average rate of long-term secular variation was much lower than either the average annual rate of cyclical fluctuation (about 13 per cent), or of year-to-year fluctuation (about 14 per cent) or the average within-year fluctuation of 30 per cent. However, some commodities, owing to long-term factors, had price decreases of 7 per cent per year or more — well above the lowest figures for year-to-year fluctuations.

The average duration of secular rise (about twenty-two years), was greater than the average duration of decline in prices (about fifteen years) in the ratio of about three to two. This ratio held for both import unit values and market prices. Since both the rate and the

Table 14. Long-Term Trends in Market Prices, 1901 to 1950

Commodity	Rising phase: Number of years	Rising phase: Average percentage increase per year	Falling phase: Number of years	Falling phase: Average percentage decrease per year
Antimony	22	5	16	5
Bananas	22	5	7	4
Barley	26	5	14	4
Bauxite	15	2	24	—*
Chrome	9	3	8	4
Cocoa	15	3	23	5
Coconuts	7	9	19	4
Coffee	29	4	12	5
Copper	17	5	20	4
Copra	—	—	20	4
Cotton	24	5	16	4
Cotton-seed	24	5	18	7
Ground-nut oil	13	5	13	4
Ground-nuts	15	6	15	4
Hemp	18	6	22	5
Hides and skins	27	4	15	4
Jute	26	5	15	4
Lead	32	4	10	5
Linseed	24	6	15	4
Linseed oil	26	6	14	4
Maize	27	5	15	5
Manganese	5	4	13	6
Meat	26	3	17	3
Oats	25	5	15	4
Olive oil	29	5	13	4
Opium	30	4	12	4
Palm oil	23	5	19	3
Pepper	20	9	22	6
Petroleum	13	5	14	4
Phosphates	18	4	12	6
Platinum	11	3	19	4
Quinine	25	5	16	5
Rice	27	5	15	4
Rubber	17	6	24	4
Silk	18	7	22	4
Sodium nitrate	25	4	17	4
Soy-bean oil	16	5	14	3
Sugar	30	4	12	6
Tallow	22	5	18	4
Tea	33	3	8	4
Tin	37	3	5	6
Tobacco	22	5	18	4
Tungsten	23	3	5	12
Wheat	27	4	15	4
Wool	30	4	12	5
Zinc	26	4	16	3
AVERAGE, 46 COMMODITIES	*22.1*	*4.7*	*15.3*	*4.4*
AVERAGE, MARKET PRICES, 22 COMMODITIES[b]	*22.1*	*4.6*	*15.5*	*4.4*
AVERAGE, IMPORT UNIT VALUES, 22 COMMODITIES[b]	*23.4*	*4.5*	*15.0*	*4.4*

* Average decrease of 0.25 per cent.
[b] For which both market prices and import unit values were available.

duration of secular rise were greater than for the decline, the total amplitude of secular rise, on an average, was greater than the total amplitude of secular fall — by about 40 per cent.

The range of the annual long-term rate of rise in respect of unit values was from below one per cent (bananas) to 8.8 per cent (shellac); the corresponding range for the falling phases was from below one per cent (nickel) to 7.1 per cent (rubber). The corresponding ranges in respect of market prices were from 2 per cent to 9 per cent and from well below one per cent to 12 per cent, respectively.

The rate of decrease in unit values during falling phases was highest for rubber; its corresponding total amplitude was also one of the highest. Other commodities which registered high rates of decline were jute, shellac, silk and sugar. Commodities with more moderate long-term declines were coffee, cotton, sisal, tea and wool. The commodity with the lowest rate of decline was nickel (below one per cent). Bananas came next with a rate of 1.5 per cent. Fibres, except for hemp, and beverages (excluding cocoa) recorded above-average rates of fall; minerals and cereals below-average rates.

When market price trends of the forty-six commodities were examined, it was found that tungsten (12 per cent) registered the highest rate of secular fall (but had only five years of falling trend as against twenty-three years of rising trend). About one-third of the commodities listed recorded above-average decline. Less than one-fourth of the commodities had a relatively long period (twenty years or more) of secular fall.

Although the annual rate of change attributable to long-term factors appears modest when compared with year-to-year, cyclical and within-year changes, it does not follow that long-term changes were less important. It is evident from table 15, which is confined to fourteen major commodities, that there were continuous long-trend movements, both upward and downward, resulting in total changes in commodity prices which were greater than the normal total cyclical amplitude, in spite of the modest annual rate of change. Clearly, in respect of long-term projects or long-term planning, a steady and persistent adverse long-term trend can be just as destructive of stability as a shorter-term fluctuation.

Table 15. Long-Term Market Price Trends[a] of Selected Commodities, by Periods, 1901 to 1949

Commodity and timing of phase	*Duration (years)*	*Direction*	*Percentage change*	
			Total amplitude	*Rate per year*
Cocoa:				
1905 to 1912	7	Falling	13	2.0
1912 to 1917	5	Rising	12	2.4
1917 to 1933	16	Falling	61	4.0
1933 to 1943	10	Rising	27	2.7
Coffee:				
1904 to 1914	10	Rising	34	3.4
1915 to 1926	11	Rising	39	3.6
1926 to 1938	12	Falling	60	5.0
1938 to 1946	8	Rising	45	5.6
Copper:				
1904 to 1911	7	Falling	13	2.0
1911 to 1917	6	Rising	35	5.8
1917 to 1934	17	Falling	59	3.5
1934 to 1946	12	Rising	46	3.9
Cotton:				
1904 to 1912	8	Rising	19	2.4
1912 to 1920	8	Rising	56	7.0
1920 to 1936	16	Falling	60	4.0
1936 to 1944	8	Rising	54	6.8
Hemp:				
1904 to 1911	7	Falling	34	5.0
1911 to 1918	7	Rising	60	8.6
1918 to 1933	15	Falling	68	4.0
1933 to 1944	11	Rising	56	5.1
Jute:				
1904 to 1910	6	Rising	13	2.2
1910 to 1919	9	Rising	50	5.6
1919 to 1934	15	Falling	61	4.0
1934 to 1945	11	Rising	71	6.5

Table 15 (*continued*)

Commodity and timing of phase	*Duration (years)*	*Direction*	*Percentage change*	
			Total amplitude	*Rate per year*
Linseed:				
1906 to 1911	5	Rising	24	4.8
1911 to 1919	8	Rising	50	6.3
1919 to 1934	15	Falling	60	4.0
1934 to 1945	11	Rising	68	6.2
Petroleum:				
1916 to 1920	4	Rising	33	8.3
1920 to 1934	14	Falling	56	4.0
1934 to 1943	9	Rising	31	3.4
Rubber:				
1904 to 1909	5	Rising	42	8.4
1909 to 1933	24	Falling	93	4.0
1933 to 1943	10	Rising	67	6.7
Silk:				
1904 to 1912	8	Falling	18	2.0
1912 to 1921	9	Rising	62	6.9
1921 to 1935	14	Falling	75	5.3
1935 to 1944	9	Rising	69	7.7
Sugar:				
1904 to 1909	5	Rising	9	1.8
1910 to 1920	10	Rising	54	5.4
1920 to 1932	12	Falling	74	6.0
1932 to 1947	15	Rising	67	4.5
Tea:				
1904 to 1911	7	Rising	7	1.0
1911 to 1926	15	Rising	55	3.7
1926 to 1934	8	Falling	28	3.5
1934 to 1945	11	Rising	42	3.8
Tin:				
1904 to 1910	6	Rising	17	2.8
1911 to 1926	15	Rising	32	2.1
1926 to 1931	5	Falling	29	6.0
1931 to 1946	15	Rjsing	56	3.7
Tobacco:				
1904 to 1909	5	Rising	13	2.6
1909 to 1915	6	Falling	15	2.5
1915 to 1922	7	Rising	44	6.3
1922 to 1934	12	Falling	53	4.4
1934 to 1944	10	Rising	48	4.8

[a] Measured by seven-year moving averages.

[b] The years stated are the mid-points of the seven-year periods; the end year of one trend is not necessarily the initial year of the succeeding trend. The years covered are generally 1901 to 1949.

Within-Year Fluctuations

Study of fluctuations in prices paid for raw materials exported by under-developed countries — covering thus far analyses of yearly, cyclical and long-term changes — would not be complete without similar consideration of within-year price variations. For this analysis, monthly price data at one of the major market centres were obtained for fifteen staple commodities. The data cover fairly long periods of time, going back for some commodities to the beginning of the century. Within-year price fluctuations were measured by the range between the highest price and the lowest reached within a given year, expressed as a percentage of the higher price. Thus, the percentages for any year indicate the extent by which the low price falls short of the high within that year.

Table 16 gives average within-year market price fluctuations for the periods indicated for each of the fifteen commodities analysed. Separate averages are given for shorter periods. In view of the adoption of

extensive price control measures during the Second World War, an average for the total period, excluding 1940 to 1945, as well as one for the full span of years, is shown. The commodities in the table are arranged in descending order of average within-year price variation. Annual data which formed the constituent elements of the averages given in table 16 indicated considerable dispersion around the averages.

For the fifteen commodities, considered together, the low price reached within the year fell short of the high price, on an average, by almost 30 per cent if the Second World War period is excluded, and by 27 per cent if it is included. This means that the range of price variation amounted to almost half the low price and one-third of the high price reached within a year. Among the commodities analysed, rubber showed the greatest variation, with a within-year price range amounting, on the average, to more than two-thirds of the low, and two-fifths of the high price. The price of sugar, on the other hand, varied least, with a range equal to one-fourth of the low and one-fifth of the high price.

These wide fluctuations over short periods in the prices of staple raw materials are the combined result of secular, cyclical, yearly, seasonal and random forces. The seasonal factor is very important, at least so far as agricultural commodities are concerned. Even for commodities for which there is a steady demand, the seasonal factor alone would account for a price variation at least equal to the cost of interest and of storage involved in holding stocks; it has been estimated that such costs amount to approximately 10 per cent per year.[14] Further, the inability or unwillingness of primary producers to hold stocks until market demand improves puts them at a disadvantage and causes prices to fall. The general inelasticity of supply in relation to short-run changes in demand for most staple raw materials contributes a further element of price instability. An illustration of such inelasticity is the seven-year time lag in the adjustment of rubber supplies to increased demand. Since latex production is continuous when rubber trees have attained maturity, the impact of a falling market is concentrated entirely on price declines, while the response to a rising demand is sluggish, so that prices soar. The range of price variation may therefore be extreme. As shown in table 16, within-year price variations for rubber averaged over 40 per cent[15] of the highest price within the year. In a downward phase, this would mean that, even without fluctuations in volume, the foreign exchange receipts from it would vary widely, depending on the period within the year at which the contract was concluded.

Cocoa, cotton and jute had the next highest percentage of fluctuation, with an average within-year price variation amounting to one-third of the year's high. Beef, coffee, lead, tea, tin, wheat, wool and zinc all exhibited almost equal variations, approximately 30 per cent[15] of the high price of the year. Sugar, coconut oil and copper showed the least within-year price variation

[14] J. M. Keynes, "Policy of Government Storage of Foodstuffs and Raw Materials", *Economic Journal*, September 1938, and *Treatise on Money*, vol. 2, chapter 29 (Macmillan, New York, 1930).

[15] Excluding the period of the Second World War.

Table 16. Within-Year Fluctuations of Market Prices of Fifteen Commodities

(Average percentage fluctuation)*

Commodity, period and market	Pre-1914	1914 to 1919	1920 to 1939	1940 to 1945	1946 to 1950	Full period: Including 1940 to 1945	Full period: Excluding 1940 to 1945
Rubber, 1901 to 1950, London	30.9	38.7	48.4	10.5	40.1	37.3	41.0
Cocoa, 1906 to 1950, New York	29.3	29.9	37.6	11.9	43.6	31.9	35.1
Jute, 1921 to 1939, London	..	..	33.3	..	..	..	33.3
Cotton, 1906 to 1950, Alexandria	24.9	39.6	33.2	13.9	30.5	30.4	32.1
Wool (Argentine), 1930 to 1950, Boston	..	..	33.8	17.5	20.0	27.2	31.1
Lead, 1901 to 1950, London	23.8	29.3	34.7	2.8	29.5	26.8	30.1
Wheat, 1912 to 1939, Buenos Aires	..	33.1	30.2	..	..	..	30.0
Zinc, 1904 to 1950, London	17.6	42.7	31.1	..	32.9	25.9	29.7
Tea (Ceylon), 1915 to 1950, London	..	30.5	32.3	..	25.2	..	29.2
Tin, 1901 to 1950, New York	23.5	41.2	33.9	5.3	27.9	26.0	28.8
Beef (Argentine), 1912 to 1939, London	..	31.4	27.4	..	..	..	28.7
Coffee, 1900 to 1950, New York	24.2	34.2	30.6	9.8	25.8	26.2	28.4
Copper, 1904 to 1950, New York	22.4	27.7	25.0	2.7	27.0	21.9	24.7
Coconut oil, 1909 to 1948, New York	23.4	21.9	21.1	13.4	18.8	20.5	21.5
Sugar (Cuban), 1900 to 1950, New York	17.8	27.8	21.9	4.7	14.6	18.7	20.1
AVERAGE, 15 COMMODITIES	*23.8*	*33.0*	*31.6*	*9.3*	*28.0*	*26.6*	*29.6*

* Percentage by which the low price falls short of the high price within the year.

of the fifteen commodities analysed, the range of price variation being between one-fourth and one-fifth of the yearly highs. The non-ferrous metals considered — copper, lead, tin and zinc — did not reveal within-year price variations significantly different from many of the agricultural commodities analysed, even though the supply of these metals is not subject to seasonal influences. On the other hand, demand for these is generally highly sensitive to business conditions, and this may explain the absence of greater within-year stability.

There is no indication that within-year variations have significantly diminished in recent years. While the post-war average was slightly below the inter-war figure, it was considerably above the pre-1914 level. Wide within-year fluctuations are further evidence of the general instability in prices paid for exports from under-developed areas.

If an average within-year variation in price[16] of 30 per cent[17] is considered in conjunction with an average year-to-year fluctuation of some 14 per cent, it is evident that the average decline from the high of one year to the low of the next, when the succeeding year's average declines (or rise from the low of the first year to the high of the next, when the second year's average rises) amounts to approximately 40 per cent. Thus, year-to-year comparisons of averaged annual data fail to show the full possible extent of price fluctuation within the span of two successive years.

By periods, the largest within-year price variation occurred during the First World War (33 per cent) and the smallest during the Second World War (9.3 per cent). If peace-time periods are considered, the inter-war period exhibited the highest price variation (31.6 per cent), almost equal to that during the First World War. The period prior to 1914 had a smaller within-year price variation (23.8 per cent) than did the period after the Second World War (28.0 per cent). Exceptions to this general pattern were provided by cocoa, copper and zinc, whose within-year price variations increased consistently, on an average, over the three peace-time periods; coconut oil, on the other hand, had consistently decreasing price fluctuations over the same periods. In the case of sugar, the average within-year price variation during the post-war period was smaller than that during the period before 1914. Within-year variations during the Second World War were without exception well below the average of the First World War.

The rank of the fifteen commodities in table 16 arranged according to the magnitude of their within-year price variations during each of the three peace-time periods corresponds closely to their rank for the full period (excluding the Second World War). This is manifest in the high coefficients of correlation in rank obtained in the three cases,[18] which indicate that the same commodities fluctuated consistently more, or consistently less, than the average. Thus, rubber, cocoa, and, to a large extent, cotton, had the greatest fluctuations, while copper, coconut oil and sugar exhibited within-year price variations consistently below the others.

There was also a high degree of correspondence between the extent of within-year fluctuation and of year-to-year fluctuation in market prices of given commodities. This suggests that fluctuation in price is a characteristic inherent in certain commodities, arising from general demand and supply conditions, and that these factors tend to produce high or low vulnerability to both year-to-year and shorter-term fluctuations. Of the seven commodities which were in the most variable half in respect of within-year fluctuations, the top five also tended to be among the more variable in respect of year-to-year fluctuations. Conversely, among the seven commodities constituting the more stable half in respect of within-year fluctuations, five were also the more stable in respect of year-to-year fluctuations. The ten commodities which were thus either stable or unstable in respect of both within-year and year-to-year fluctuations also showed similar characteristics, without exception, in the various periods studied. In the post-war period, the correspondence was particularly close. All this suggests that similar market forces govern the two types of fluctuations.

Falling Import Unit Values

Fluctuations in import unit value, whether in an upward direction or downward, raise problems for under-developed countries. However, downward fluctuations are clearly of greater concern. In table 17, the average year-to-year fluctuation during years of rising prices for each of eighteen commodities is compared with the corresponding fluctuation during years of falling prices.[19]

Table 17 shows that year-to-year changes during years of decline were distinctly greater than during years of rising prices. In respect of the eighteen major commodities for which comparison was made, the average

[16] Difference between the high point and the low point, measured as a percentage of the high point.

[17] Excluding the period of the Second World War.

[18] The respective coefficients were 0.76, 0.92, and 0.94. The Spearman coefficient was used.

[19] Since the measure used in this study relates both rises and declines to the higher of the two figures, and thus a common standard is used, the fluctuations may be compared directly.

Table 17. Year-to-Year Fluctuations in Import Unit Values during Years of Rising or Falling Prices, 1901 to 1951

(Average percentage fluctuation per year)

Commodity[a]	During years of rising prices	During years of falling prices
Rubber	20	22
Linseed	17	19
Cocoa	16	18
Cotton	16	20
Hemp	16	22
Coffee	15	13
Sugar	15	15
Wheat	15	17
Jute	14	18
Wool	14	16
Copper	13	13
Tin	13	15
Rice	12	12
Silk	12	16
Tobacco	9	11
Petroleum	8	12
Tea	7	11
Sodium nitrate	6	8
AVERAGE, 18 COMMODITIES	*13.2*	*15.4*

[a] Arranged in descending order of average fluctuation during years of rising prices.

year-to-year fluctuation during years of falling prices was 15.4 per cent, compared with 13.2 per cent during years of rising prices, and an over-all average of 13.7 per cent, regardless of whether prices rose or fell.

The table shows that instability of prices during years of declining prices was greater than instability during years of rising prices in respect of fourteen commodities of the eighteen listed. For three (copper, rice and sugar) of the remainder, the instability was of equal magnitude. In one case alone (coffee) was the year-to-year rate of fall smaller than the rate of rise.

The relative rank of individual commodities in respect of their degree of fluctuation during years of declining prices was much the same as in respect of their general price instability.

Average year-to-year fluctuations during years of falling prices for a large number of subvarieties of commodities exported to the United States by under-developed countries are shown in table II, appendix D. The table gives, for the 162 items listed, the number of years of decrease in unit value and the average decrease during such years, by country. The average decrease in unit value of the 162 items was 16.5 per cent. When import unit values fell, they dropped about one-sixth a year on the average — often, of course, for more than a year in succession.

The significance of this average is evident from the fact that the median and mode of the frequency distribution were 16.5 and 16.4 per cent, respectively. The modal class (between 15 and 19.9 per cent) contained more than one-third of the items analysed. Only one-sixth of the items showed a downward variation in unit value below 10 per cent. The frequency distribution of average percentage decreases in import unit values of the 162 items is given in table 18.

Table 18. Frequency Distribution of Year-to-Year Decreases in Unit Values of Exports to the United States

Average percentage decrease per year	Number of items	Per cent of total
0 to 4.9	10	6
5 to 9.9	16	10
10 to 14.9	36	22
15 to 19.9	58	36
20 to 24.9	21	13
25 to 29.9	14	9
30 to 34.9	5	3
35 to 39.9	2	1
TOTAL	162	100

Fluctuations in Money and Real Terms

Table 19 shows the average year-to-year fluctuations in import unit values of primary commodities, first in terms of money, then in terms of the volume of manufactured imports that might be obtained per unit of the commodity concerned. For this purpose, the money prices of commodities, in United States dollars, were deflated by a price index of United Kingdom manufactured exports, converted into dollars at the current exchange rate.[20] Thus, while the first column shows the average year-to-year price fluctuations in money terms (unit value), the second column is a rough indication of the fluctuations in real prices.

The type of instability represented by price fluctuations is not only monetary, but also real, or physical. Price fluctuations in manufactured imports of under-developed countries did not offset the effects of fluctuations in the money prices of their exports. The instability is not only in terms of the foreign exchange which a ton of tin or a bag of coffee will bring in, but also in terms of the clothing, machinery or chemicals which it will buy. If all prices fluctuated together in the same direction and to a similar degree, the effect of price fluctuations on the ability of under-developed countries

[20] Virtually the same results would have been obtained if money prices had been deflated by a price index of United States manufactured exports. When dealing with the export proceeds of various countries in real terms, account was taken (in the section on "Fluctuations in Money and Real Terms" in chapter 4) of the composition and origin of imports, which vary among different under-developed countries.

Table 19. Year-to-Year Fluctuations in Import Unit Values, in Money and Real Terms, 1901 to 1951

(Average percentage fluctuation per year)

Commodity	Money value	Real terms	Commodity	Money value	Real terms
Rubber	20.7	19.6	Coffee	14.3	14.1
Copra	19.1	16.9	Tin	13.9	12.1
Hemp	19.1	17.1	Copper	12.5	11.0
Shellac	19.0	16.9	Hides and skins	12.5	11.6
Cotton	18.4	15.4	Rice	11.6	15.0
Linseed	18.2	14.7	Manganese	11.3	14.3
Cocoa	16.7	15.4	Tobacco	10.1	10.9
Sisal	16.2	12.5	Petroleum	9.7	13.4
Jute	16.1	16.5	Tea	8.8	8.1
Wheat	15.7	13.8	Nickel	5.5	9.7
Sugar	15.3	16.4	Sodium nitrate	4.9	8.0
Wool	14.7	12.2	Bananas	4.7	9.4
Silk	14.4	13.1	AVERAGE, 25 COMMODITIES	*±13.7*	*±13.5*

to obtain foreign goods might not be serious. In fact, as table 19 makes clear, the ability of under-developed countries to obtain foreign goods was affected by a price change in almost the same degree as their ability to obtain foreign exchange.

The average year-to-year price fluctuation in both money and real terms was just under 14 per cent. In sixteen of the twenty-five commodities examined, fluctuations in real terms were relatively lower by a small margin; and in the remaining nine cases they were

Table 20. Year-to-Year Fluctuations in Import Unit Values in Real Terms, by Periods

(Average percentage fluctuation per year)

Commodity	Peace-time period			War period		Full period
	1901 to 1913	1920 to 1939	1946 to 1951	1914 to 1919	1940 to 1945	
Rubber	11.7	26.6	18.5	23.3	9.0	19.6
Copra	11.8	15.9	28.8	14.4	16.3	16.9
Hemp	..	18.1	..	..	7.5	17.1
Shellac	17.5	20.1	8.5	17.8	12.7	16.9
Cotton	12.2	14.4	27.8	14.2	16.5	15.4
Linseed	16.7	13.6	37.5	11.0	21.3	14.7
Cocoa	10.4	16.6	40.0	17.8	10.7	15.4
Sisal	7.3	13.5	17.7	9.5	10.3	12.5
Jute	14.5	16.1	18.3	22.7	15.0	16.5
Wheat	15.1	11.7	11.9	21.1	12.5	13.8
Sugar	12.9	20.9	16.7	14.2	10.5	16.4
Wool	10.3	16.3	11.0	7.0	8.0	12.2
Silk	5.8	15.6	..	13.8	21.3	13.1
Coffee	7.8	15.4	15.8	26.2	9.5	14.1
Tin	9.1	16.4	13.0	12.2	7.5	12.1
Copper	10.1	12.2	10.5	16.3	7.5	11.0
Hides and skins	4.8	14.0	10.2	19.3	11.1	11.6
Rice	26.9	15.5	22.8	20.2	25.4	15.0
Manganese	..	15.9	16.9	..	7.0	14.3
Tobacco	7.3	10.7	7.0	17.3	14.2	10.9
Petroleum	24.0	11.6	20.0	17.5	9.3	13.4
Tea	5.3	9.4	4.5	12.3	7.5	8.1
Nickel	..	10.9	8.8	..	6.7	9.7
Sodium nitrate	5.3	10.3	10.6	10.7	7.5	8.0
Bananas	..	8.9	13.6	..	6.6	9.4
AVERAGE, 25 COMMODITIES	*11.8*	*14.8*	*17.0*	*16.1*	*11.7*	*13.5*

higher — substantially so for several of these commodities.

The amount of foreign manufactures obtainable per unit of exports varied by approximately 14 per cent per year in either direction. The position of individual commodities with respect to such fluctuations, as in the case of prices, differed considerably, ranging from 8 per cent a year in the case of tea and sodium nitrate to 19.6 per cent a year in the case of rubber. The range was narrower in respect of real unit values than of money unit values.

Table 20 shows year-to-year fluctuations in real import unit value by periods. In the majority of cases, fluctuations in real terms increased during peace-time, comparing 1901 to 1913 with 1920 to 1939, but declined between the period 1920 to 1939 and the period 1946 to 1951. When the two war periods were compared, it was found in the majority of cases that fluctuations declined in real terms. When fluctuations during these periods were examined in their normal time sequence, it was found that instances of progressive increase were rare (copra, silk and cotton). In the majority of cases fluctuations increased during 1914 to 1919 but declined during 1920 to 1939. In most cases they declined further during 1940 to 1945 but increased during 1946 to 1951.

Fluctuations in real unit values were in general lower than fluctuations in money unit values, chiefly in the case of commodities with relatively greater fluctuations, while for commodities with below-average fluctuations the position was reversed.

Interrelation of Year-to-Year, Cyclical, Long-Term and Within-Year Fluctuations

In the preceding sections, the different types of unit value fluctuations have been discussed separately. The present section considers the question of correlation between them. In the sense that the commodities which tended to be unstable in one of these respects also tended to be unstable in others, and vice versa, there appears to be a marked interrelation among the various types of fluctuation. Thus, particular commodities, as a result of specific market conditions, tended to display a characteristic degree of instability in respect of all types of fluctuation studied. This general pattern does not, of course, preclude the existence of commodities which are unstable in some respects but stable in others.

Study of the connexion between year-to-year fluctuations in prices (table 4) and cyclical amplitude of downswings[21] (table 11) was based on eighteen primary commodities for which unit values were available. Of these commodities, twelve showed above-average year-to-year declines in unit value. Ten of the twelve were also more sensitive than the average in respect of cyclical downswings; only two were relatively stable in the latter respect. On the other hand, of the six commodities which had below-average sensitiveness to year-to-year fluctuations, five also had below-average sensitiveness to cyclical downswings. Thus, of the eighteen commodities analysed, fifteen showed the same tendency to be unstable in both respects, or stable, and only three did not. In ranking different commodities for year-to-year fluctuations and cyclical declines, the coefficient of correlation was +0.81, providing clear evidence of a connexion between the two types of change. This close correlation provides further evidence — in addition to the similarity of the average percentage change[22] — that year-to-year fluctuations in prices are largely determined by cyclical factors.

Of the eighteen commodities analysed with regard to year-to-year fluctuations as compared with the rate of decline during falling phases of long-term trends in unit values (table 13), ten showed similar movements, that is, they were either relatively stable, or unstable, in both respects. Of the eight remaining commodities, five were stable in one respect but not in the other. The predominance of commodities with similar movements in both respects denoted some correlation between long-term instability and year-to-year instability. The correlation, however, was slight compared with that between year-to-year declines and cyclical declines; the coefficient of correlation in respect of rank was +0.19.

Of the eighteen commodities investigated with respect to the connexion between the amplitude of cyclical downswings and of long-term declines, the majority, ten, moved similarly in both respects, and only a minority, eight, behaved differently. The evidence of correlation between the two series, however, showed a coefficient of correlation of +0.21 in respect of rank.

The correlation between the different types of price fluctuation indicated that, among the eighteen commodities analysed, ten were more vulnerable or less vulnerable to price fluctuations than the average in all three respects: year-to-year, cyclical and long-term. Six of these commodities were unstable in all three respects; these were coffee, cotton, jute, rubber, silk and wool, largely the rubber and textile group. The four commodities which were stable in all three respects were copper, petroleum, sodium nitrate and tobacco. The prevalence of minerals and the absence of textiles in this group is noteworthy.

Of the fifteen commodities for which within-year variations were available, corresponding unit values were available for only eleven. The latter were utilized

[21] The result would have been similar if upswings or averages of upswings and downswings had been examined.

[22] Cyclical movements expressed as an annual rate. See the section on cyclical fluctuations earlier in this chapter.

to determine the correlation between within-year price fluctuations on the one hand and year-to-year declines and cyclical downswings on the other. Of the seven which were above the average with respect to within-year fluctuations, six were also above the average in the degree of year-to-year decline. The four among the eleven commodities which were below the average in within-year fluctuations were all below the average in respect of year-to-year declines. Thus, ten of the eleven commodities analysed showed similar changes in both respects. This suggested possible correlation between the two, though the number was too small for definite conclusions. The coefficient of correlation between the two series in respect of rank was +0.78.

Of the seven commodities which showed above-average within-year fluctuations, five were above and two below the average in respect of cyclical downswings. Of the four commodities with below-average within-year variations, two were below and two above the average in cyclical downswings. Thus, of the eleven commodities analysed, seven were simultaneously stable, or unstable, with respect to both within-year and cyclical fluctuations. A rank correlation of +0.44 was indicated, but the number of commodities was too small for definite conclusions.

To sum up, some evidence of correlation in respect of instability was found in nearly all the series investigated. A glance at the tables in this chapter arranged in descending order of extent of fluctuation shows that the same commodities are consistently at the top or close to the top, while certain others are generally near the bottom. A summary statement of price fluctuations of different types, expressed in average percentage fluctuations per year, is given in table 21.

Table 21. Year-to-Year, Cyclical, Long-Term and Within-Year Fluctuations in Import Unit Values and Market Prices, 1901 to 1951

(Average percentage fluctuation per year)

Commodity	Year-to-year: Import unit value: Increase and decrease	Year-to-year: Import unit value: Decrease	Year-to-year: Import unit value: Real terms	Year-to-year: Market price: Increase and decrease	Cyclical: Import unit value: Upswing	Cyclical: Import unit value: Downswing	Cyclical: Market price: Upswing	Cyclical: Market price: Downswing	Long-term: Import unit value: Rising phase	Long-term: Import unit value: Falling phase	Long-term: Market price: Rising phase	Long-term: Market price: Falling phase	Within-year market price fluctuations
Antimony	..	..	...	19	..	..	16	16	..	..	5	5	..
Bananas	5	..	9	13	3	3	12	11	1	2	5	4	..
Barley	..	..	...	13	..	..	12	12	..	..	5	4	..
Bauxite	..	..	...	5	..	..	4	11	..	..	2	—	..
Chrome	..	..	...	18	..	..	17	23	..	..	3	4	..
Cocoa	17	18	15	17	16	18	15	16	5	4	3	3	32
Coconut	..	..	...	12	..	..	11	11	..	..	9	4	21[a]
Coffee	14	13	17	17	18	13	15	18	5	6	4	5	26
Copper	13	13	11	14	14	11	12	14	5	4	5	4	22
Copra	19	..	17	16	15	16	14	18	6	4	—	4	..
Cotton	18	20	15	15	16	19	13	14	5	5	5	4	30
Cotton-seed	..	..	...	18	..	..	18	21	..	..	5	7	..
Ground-nuts	..	..	...	16	..	..	15	21	..	..	6	4	..
Ground-nut oil	..	..	...	17	..	..	15	14	..	..	5	4	..
Hemp	19	22	17	16	15	16	12	15	6	3	6	5	..
Hides and skins	13	..	12	11	12	13	11	10	6	4	4	4	..
Jute	16	18	17	15	15	20	16	14	4	7	5	4	33[b]
Lead	..	..	...	13	..	..	17	14	..	..	4	5	27
Linseed	18	19	15	13	19	15	10	15	6	4	6	4	..
Linseed oil	..	..	...	16	..	..	12	19	..	..	6	4	..
Maize	..	..	...	13	..	..	10	17	..	..	5	5	..
Manganese	11	..	14	19	6	6	12	29	4	3	4	6	..
Meat	..	..	...	6	..	..	5	5	..	..	3	3	29[b]
Nickel	5	..	10	..	4	3	..	..	3	1	..	..	..
Oats	..	..	...	11	..	..	13	10	..	..	5	4	..
Olive oil	..	..	...	13	..	..	12	11	..	..	5	4	..
Opium	..	..	...	12	..	..	13	9	..	..	4	4	..
Palm oil	..	..	...	12	..	..	11	12	..	..	5	3	..
Pepper	..	..	...	20	..	..	22	18	..	..	9	6	..
Petroleum	10	12	13	16	9	9	16	23	6	4	5	4	..

Table 21 (*continued*)

Commodity	Year-to-year: Import unit value: Increase and decrease	Year-to-year: Import unit value: Decrease	Year-to-year: Import unit value: Real terms	Year-to-year: Market price: Increase and decrease	Cyclical: Import unit value: Up-swing	Cyclical: Import unit value: Down-swing	Cyclical: Market price: Up-swing	Cyclical: Market price: Down-swing	Long-term: Import unit value: Rising phase	Long-term: Import unit value: Falling phase	Long-term: Market price: Rising phase	Long-term: Market price: Falling phase	Within-year market price fluctuations
Phosphates	..	..	...	12	..	..	10	18	..	..	4	6	..
Platinum	..	..	...	13	..	..	12	11	..	..	3	4	..
Quinine	..	..	...	8	..	..	10	7	..	..	5	5	..
Rice	12	12	15	13	13	16	13	12	3	4	5	4	..
Rubber	21	22	20	21	18	15	24	18	5	7	6	4	37
Shellac	19	..	17	..	22	15	..	..	9	6	..	..	..
Silk	14	16	13	14	12	21	14	13	6	6	7	4	..
Sisal	16	..	13	..	15	12	..	..	5	5	..	..	..
Sodium nitrate	5	9	8	7	6	9	5	6	4	3	4	4	..
Soy-bean oil	..	..	...	15	..	..	15	15	..	..	5	3	..
Sugar	15	15	16	17	12	14	16	16	4	6	4	6	19
Tallow	..	..	...	12	..	..	14	10	..	..	5	4	..
Tea	9	11	8	7	8	11	6	5	3	5	3	4	29[b]
Tin	14	15	12	13	11	14	13	9	3	4	3	6	26
Tobacco	10	11	11	18	10	10	10	18	6	4	5	4	..
Tungsten	..	..	...	16	..	..	17	18	..	..	3	12	..
Wheat	16	17	14	12	15	11	10	8	4	4	4	4	30[b]
Wool	15	16	12	14	14	13	13	17	4	5	4	5	27
Zinc	..	..	...	14	..	..	17	16	..	..	4	3	26
AVERAGE, 49 COMMODITIES[c]	*±13.7 – 15.4*		*±13.5*	*±14.0*	*+12.7 – 13.0*		*+13.0 – 14.3*		*+4.7 – 4.3*		*+4.7 – 4.4*		*26.6*

[a] Price of coconut oil.
[b] Excluding period of Second World War.
[c] Average includes fewer commodities where necessary information was not available.

Chapter 3

FLUCTUATIONS IN VOLUME OF EXPORTS

Study of the relation of fluctuations in price to fluctuations in proceeds, as presented in chapter 5, throws light on the *net* contribution of fluctuations in quantity to instability in proceeds. It has already been indicated[1] that fluctuations in volume have nearly always resulted in intensifying fluctuations in proceeds. Such indirect comparisons, however, do not show the full extent of variations in volume, since the effects of quantity variations which intensify price instability are cancelled out in part by those which counteract fluctuations in proceeds. It is, therefore, useful to estimate the gross contribution of fluctuations in quantity to the instability of export proceeds, by computing quantity fluctuations separately. Such computations — covering year-to-year fluctuations, cyclical movements and long-term trends — are given in the present chapter; the analysis is confined to eighteen primary commodities exported by selected under-developed countries.

Year-to-Year Fluctuations

Table 22 gives information with respect to year-to-year fluctuations in quantity. The average shown for each commodity is weighted according to the value of the exports of the under-developed countries listed. In the case of some commodities, such as wheat, the major exporters are not under-developed countries; the figures are therefore not representative of the commodity situation as a whole, but only in so far as under-developed countries are affected. The general average is the simple average of all the commodities covered.

The most striking feature of the relation between average year-to-year fluctuations in price and in volume is the higher magnitude of variations in quantity. The average fluctuation in quantity from year to year was about 18.7 per cent, compared with 13.7 per cent in the case of year-to-year unit value variations.[2] In other words, if one year's export volume was 100, that of the following year would average 81 or 123,[3] with the possibility of an even wider range.

Table 22 lists commodities in descending order of average year-to-year fluctuations in export volume; the range was from 6 per cent in the case of wool to 33 per cent in the case of wheat. Of the forty-seven cases examined, the average year-to-year variation in quantity was above the general average of 18.7 per cent in twenty instances, and was less than 13 per cent in eight. The export volume of both cereals, wheat and rice, was more unstable than the average but that of sugar, beverages (tea, coffee and cocoa) and tobacco was more stable. Cotton was unstable in volume, but the other textiles (jute, hemp, silk and, especially, wool) were relatively stable. The export volume of linseed and rubber fluctuated considerably. All the minerals, with the exception of sodium nitrate, were relatively stable in quantity, compared with the average year-to-year fluctuation of 18.7 per cent.

Of the eighteen commodities listed in the table, thirteen showed greater instability in quantity than in unit value. Of these, sodium nitrate exhibited the widest disparity. The four commodities in which the opposite situation existed, that is, less variation in volume than in price, were coffee, hemp, silk and, especially, wool. In the case of the remaining commodity — cocoa — price and volume fluctuations were of the same order.

Table 22 indicates that there were substantial differences in the vulnerability of various exporters of given commodities to fluctuations in volume. The relation between instability in volume and instability in unit values also varied considerably. (In about 80 per cent of the forty-seven cases examined, year-to-year volume fluctuations were in excess of average price fluctuations). Greater instability in volume than in unit value was found in the following instances: cocoa (Trinidad and Tobago only); coffee (only Brazil); copper (except Peru); cotton (except Egypt); jute; linseed; petroleum; rice; rubber; sodium nitrate; sugar; tea (except Ceylon); tin (except Bolivia); tobacco; and wheat.

Fluctuations in volume were generally greater than those in price, but sometimes the variation in volume tended to move counter to that of price, thereby wholly or partly counteracting the effect of the price variation. This was especially the case when price movements were of a short-term, non-cyclical nature and were due to forces operating on supply.

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[1] See "Summary of Findings" in chapter 1.

[2] See chapter 2, above.

[3] A rise of 23 points, according to the conventional method of measuring, is about 19 per cent of the higher figure of 123.

Table 22. Year-to-Year Fluctuations in Export Volume, by Periods

(Average percentage fluctuation per year)

Commodity[a] and country	Period covered	Peace-time period			War period		Full period
		1901 to 1913	1920 to 1939	1946 to 1950	1914 to 1919	1940 to 1945	
Wheat:							
Argentina	1914 to 1950	..	36.2	26.7	44.0	15.7	33.3
Linseed:							
Argentina	1904 to 1946	28.1	20.0	72.0	44.7	37.8	29.0
India and Pakistan	1904 to 1950	31.1	37.4	28.2	36.3	47.8	36.3
Morocco, French	1910 to 1950	46.8	27.2	63.0	54.3	64.6	41.8
Average		*29.7*	*23.7*	*63.2*	*43.7*	*41.2*	*31.1*
Rubber:							
Indonesia	1911 to 1950	35.3	16.2	38.4	33.5	53.7	28.6
Malaya	1906 to 1949	49.3	15.1	33.2	30.8	46.2	29.4
Average		*43.1*	*15.6*	*35.8*	*32.0*	*49.5*	*29.0*
Sodium nitrate:							
Chile	1914 to 1950	..	27.6	9.1	24.7	13.3	22.3
Cotton:							
Brazil	1904 to 1950	38.7	55.0	27.6	54.5	35.3	46.0
China	1904 to 1944	23.4	28.5	..	15.0	58.4	28.9
Egypt	1904 to 1950	9.6	12.3	14.4	20.0	22.3	14.2
India and Pakistan	1904 to 1950	18.1	18.2	32.8	25.2	32.5	22.5
Peru	1905 to 1950	17.0	10.0	30.0	18.7	51.8	20.1
Average		*16.6*	*18.4*	*25.8*	*24.2*	*31.8*	*21.3*
Rice:							
Indochina	1914 to 1950	..	15.2	39.5[b]	13.6	18.1	18.1
Thailand	1914 to 1950	..	20.5	35.2	15.5	30.2	23.2
Average		..	*17.9*	*37.4*	*14.6*	*24.2*	*20.7*
Sugar:							
Cuba	1903 to 1950	21.6	14.9	12.6	8.5	27.7	17.0
Indonesia	1902 to 1950	7.0	16.8	60.3[c]	6.0	25.2	17.2
Mauritius	1902 to 1950	20.8	17.7	15.4	11.5	20.5	17.9
Philippines	1902 to 1950	22.5	16.0	42.6	4.5	52.5	23.4
Average		*17.4*	*15.7*	*32.9*	*7.0*	*31.9*	*18.3*
Petroleum:							
Mexico	1913 to 1950	47.7	14.3	9.8	17.7	7.5	21.6
Middle East	1914 to 1950	..	11.9	20.3	24.0	21.0	16.5
Iran	1914 to 1950	..	10.3	10.8	24.0	20.0	14.2
Romania	1913 to 1950	15.4	12.2	15.2	29.3	13.7	15.6
Average		*36.9*	*12.8*	*16.0*	*22.8*	*14.8*	*18.1*
Tin:							
Belgian Congo	1917 to 1950	..	29.6	8.9	..	10.7	25.9
Bolivia	1902 to 1950	10.0	12.5	10.2	9.4	10.8	11.1
Indonesia	1902 to 1950	7.7	14.7	41.4	5.7	55.8	19.6
Malaya	1902 to 1950	3.9	15.8	39.2	4.3	49.3	18.0
Nigeria	1904 to 1950	58.9	14.9	5.7	7.3	6.2	21.2
Thailand	1902 to 1950	10.2	10.8	40.7	7.7	30.5	15.7
Average		*10.9*	*15.4*	*29.0*	*6.3*	*35.3*	*17.5*
Jute:							
India and Pakistan	1902 to 1950	10.8	13.6	30.6	20.8	24.2	16.8

Table 22 (*continued*)

Commodity[a] and country	Period covered	Peace-time period: 1901 to 1913	Peace-time period: 1920 to 1939	Peace-time period: 1946 to 1950	War period: 1914 to 1919	War period: 1940 to 1945	Full period
Cocoa:							
Brazil	1910 to 1950	11.4	10.3	26.8	19.7	25.1	16.0
Gold Coast	1910 to 1950	20.3	11.4	12.4	27.0	21.5	16.2
Trinidad and Tobago	1910 to 1950	13.8	23.7	28.4	14.0	29.7	22.8
Average		*17.5*	*12.2*	*17.3*	*24.1*	*23.1*	*16.7*
Hemp:							
Philippines	1920 to 1950	..	14.3	33.8	..	4.0	16.5
Copper:							
Chile	1902 to 1950	8.8	22.2	11.5	23.7	6.8	16.1
Mexico	1902 to 1950	17.7	20.8	4.4	26.8	16.2	18.5
Peru	1902 to 1950	10.9	11.8	19.4	10.7	9.0	11.9
Average		*11.6*	*20.3*	*9.9*	*22.7*	*9.8*	*16.3*
Tobacco:							
Algeria	1902 to 1950	17.7	22.9	22.4	26.3	27.7	22.6
Indonesia	1902 to 1938	24.0	12.1	..	13.3	..	15.7
Philippines	1904 to 1950	15.6	11.0	..	11.7	..	12.4
Average		*20.2*	*13.5*	*22.4*	*14.9*	*27.7*	*15.8*
Silk:							
Korea	1914 to 1939	..	9.9	..	17.7	..	13.4
Coffee:							
Brazil	1902 to 1950	20.3	10.4	12.0	27.5	21.3	16.4
Other countries	1902 to 1950	10.5	7.2	1.6	12.3	9.5	8.3
Average		*17.0*	*9.3*	*6.8*	*22.4*	*17.4*	*12.4*
Tea:							
Ceylon	1910 to 1950	2.8	5.5	5.1	6.8	7.3	5.6
China	1910 to 1950	3.5	14.6	22.6[b]	27.5	55.8	21.5
India and Pakistan	1910 to 1950	4.5	6.1	21.3	12.0	13.0	9.7
Average		*3.8*	*7.3*	*16.1*	*12.9*	*18.2*	*10.3*
Wool:							
Argentina	1923 to 1948	..	4.2	5.2	..	6.1	4.8
Uruguay	1923 to 1948	..	10.3	7.1	..	9.5	9.6
Average		..	*5.7*	*5.7*	..	*7.0*	*6.0*
AVERAGE, 18 COMMODITIES		*±19.6*	*±16.1*	*±24.6*	*±22.2*	*±22.9*	*±18.7*

Source: See appendix A.

[a] Listed in descending order of the average amount of fluctuation in volume during the full period.

[b] 1947 to 1950.
[c] 1948 to 1950.

Unlike price fluctuations, fluctuations in volume did not increase progressively during peace-time years. In general, they declined during the nineteen twenties and the nineteen thirties, when compared with year-to-year fluctuations in volume during 1901 to 1913 but increased during 1946 to 1950. Unlike price fluctuations, fluctuations in quantity were of similar magnitude during the First and Second World Wars, that is, when 1914 to 1919 and 1940 to 1945 are compared. Fluctuations in volume tended to increase during the decade from 1940 to 1950, but this was not true of prices except in more recent post-war years.

Fluctuations in:	Peace-time period: 1901 to 1913	Peace-time period: 1920 to 1939	Peace-time period: 1946 to 1950	War period: 1914 to 1919	War period: 1940 to 1945	Full period
Volume	19.6	16.1	24.6	22.2	22.9	18.7
Price (unit value)	10.9	15.0	17.8	15.6	11.6	13.7

Furthermore, price fluctuations were relatively lower during war periods as a whole than during peace periods as a whole, because of the effectiveness of controls in regulating prices during war, but fluctuations in volume averaged somewhat more during war than during peace. At no time did instability in price reach the extent of year-to-year volume fluctuations in any of the shorter periods studied, though the difference was small in the period from 1920 to 1939.

The highest fluctuations in volume during peace years occurred in the cases of jute from India (and Pakistan), sugar from the Philippines, cotton from Brazil and India, linseed from Argentina, India and French Morocco, rubber from Indonesia and Malaya, hemp from the Philippines, tin from Indonesia, Malaya and Thailand, cocoa from Brazil and rice from Thailand. The widest volume fluctuations during the First World War were those in Brazilian cotton, Argentine, Indian and French Moroccan linseed, Indonesian and Malayan rubber, Middle East and Romanian oil, Chilean sodium nitrate, Argentine wheat and Korean silk. During the Second World War, fluctuations in the volume of exports were greatest in the case of Chinese tea, Philippine sugar, Brazilian, Chinese, Indian and Peruvian cotton, Argentine, Indian and French Moroccan linseed, Indonesian and Malayan rubber, Indonesian and Malayan tin, and rice from Thailand. Obviously, the widest fluctuations in respect of export volume were experienced by countries affected by war.

The only commodity which had above-average year-to-year instability in export volume during all three of the peace-time periods studied was linseed; rice was above the average in the two periods covered. Tea, coffee and cocoa were consistently below the average in instability, and wool was below for the two periods covered. Above-average instability during both wars was shown by cocoa, cotton, linseed and rubber; greater stability during a war period by tea,[4] coffee, wool, hemp, copper and petroleum. Consistent increases in instability in volume through the three peace-time periods occurred in the cases of cotton, jute, tea and tin; a consistent decrease occurred only in coffee.

Year-to-year fluctuations in the volume of United States imports from 1923 to 1939 are shown below on a regional basis.[5]

Exporting region	*1923 to 1939*
All exports	10.7
Under-developed areas:	
Latin America	10.1
Oversea sterling area	14.5
Other under-developed countries	10.2

The average year-to-year fluctuation of 18.7 per cent in the volume of primary commodities exported by under-developed countries, as a whole, may be compared with a fluctuation of 10.7 per cent from year to year in the volume of all United States imports. The figure of 10.7 per cent refers only to the period since 1923, but a study of table 22, above, which also includes data for shorter periods, does not suggest that the difference is explained by this fact.

It appears from the above figures that United States imports from the oversea sterling area — including rubber and tin imports — were more variable in volume than general United States imports, but those from Latin America and from other under-developed countries were slightly less variable. However, even the average for the oversea sterling area as a whole was below the figure of 18.7 per cent for average year-to-year fluctuations in volume of the eighteen primary commodities covered. This indicates that an aggregate of a larger number of commodities, including other than primary commodities, shows smaller fluctuations, since some of the variations are in different directions and thus cancel each other out. Larger groupings of countries and regions likewise show similar results.

The relation between average year-to-year variations in price and in quantity (13.7 per cent in unit value and 18.7 per cent in volume) was similar to that obtaining for all United States imports. Between 1923 and 1939, the average United States import price index varied by 8.3 per cent from year to year, and the average volume of imports by 10.7 per cent. Thus, in both cases the volume of exports tended to be more unstable than prices, and in roughly the same proportion.

Cyclical Movements

As in the case of prices, analysis of variations in volume was extended to cyclical changes. Table 23 presents a summary statement of cyclical variations (after elimination of the long-term trend) in quantity exported in respect of eighteen commodities from under-developed countries. There were approximately ten cycles in the export volume of each commodity during the period covered by the study. The average duration of each phase — upswing or downswing — was under two years, while the average duration of each phase of the price cycle was over two years. The total amplitude of upswing in volume averaged 27.7 per cent (38 per cent of the low point) and the total amplitude of downswing in volume averaged 27.3 per cent. This was only a little higher than the total amplitude of cyclical fluctuations in price or unit value, but

[4] During both war periods.

[5] *Cf.* chapter 2, footnote 8, for source of figures.

Table 23. Cyclical Movements in Export Volume, 1901 to 1950

Commodity[a] and country	Period covered	Upswing: Number of upswings	Upswing: Total duration (years)	Upswing: Percentage increase: Total amplitude[b]	Upswing: Percentage increase: Rate per year	Downswing: Number of downswings	Downswing: Total duration (years)	Downswing: Percentage decrease: Total amplitude[c]	Downswing: Percentage decrease: Rate per year
Wheat:									
Argentina	1914 to 1950	9	19	51.6	31.8	9	15	56.5	39.2
Linseed:									
Argentina	1904 to 1946	12	19	38.5	24.6	11	18	37.5	23.9
India and Pakistan.	1904 to 1950	14	21	49.3	34.8	14	20	52.8	40.7
Morocco, French ..	1910 to 1950	10	16	56.0	41.2	9	16	57.5	36.6
Average		*12*	*19*	*42.0*	*27.0*	*11*	*18*	*42.0*	*28.0*
Sodium nitrate:									
Chile	1914 to 1950	10	18	36.6	23.5	10	16	36.4	25.0
Rice:									
Indochina	1914 to 1950	7	15	30.8	16.8	6	12	30.3	16.9
Thailand	1914 to 1950	9	14	38.8	29.9	8	20	40.2	15.9
Average		*8*	*15*	*35.0*	*23.0*	*7*	*16*	*35.0*	*16.4*
Hemp:									
Philippines	1920 to 1950	3	6	26.7	12.0	3	10	34.7	10.8
Cotton:									
Brazil	1904 to 1950	12	21	58.8	46.8	12	20	58.8	41.3
China	1904 to 1944	9	19	46.1	25.2	8	16	46.8	26.9
Egypt	1904 to 1950	13	23	20.7	13.1	13	18	20.6	16.7
India and Pakistan.	1904 to 1950	12	22	33.5	18.2	11	19	33.3	18.7
Peru	1905 to 1950	13	21	31.6	22.2	13	19	32.5	26.3
Average		*12*	*21*	*31.0*	*19.0*	*11*	*18*	*31.0*	*20.0*
Rubber:									
Indonesia	1911 to 1950	11	18	37.0	26.6	12	16	29.6	22.6
Malaya	1906 to 1949	10	23	39.4	23.1	9	16	32.6	19.2
Average		*11*	*21*	*38.0*	*25.0*	*10*	*16*	*31.0*	*21.0*
Tin:									
Belgian Congo	1917 to 1950	8	17	32.1	15.2	9	14	31.1	22.6
Bolivia	1902 to 1950	11	18	18.9	10.9	11	24	18.7	8.3
Indonesia	1902 to 1950	12	23	29.9	19.4	12	20	28.2	18.3
Malaya	1902 to 1950	9	20	35.2	17.7	9	22	35.8	20.1
Nigeria	1904 to 1950	8	20	36.0	13.2	9	22	34.6	23.4
Thailand	1902 to 1950	10	19	17.7	9.9	10	24	23.1	9.9
Average		*10*	*20*	*29.0*	*16.0*	*10*	*21*	*29.0*	*17.0*
Cocoa:									
Brazil	1910 to 1950	11	16	23.6	18.7	12	19	21.2	15.8
Gold Coast	1910 to 1950	10	17	26.2	18.4	9	18	27.9	18.8
Trinidad and Tobago	1910 to 1950	13	17	29.0	24.8	12	18	31.1	24.3
Average		*11*	*17*	*26.0*	*19.0*	*11*	*18*	*26.0*	*19.0*
Tobacco:									
Algeria	1902 to 1950	17	22	31.7	24.4	16	21	31.8	25.4
Indonesia	1902 to 1938	9	17	29.6	20.6	8	12	25.5	18.7
Philippines	1904 to 1950	9	13	18.9	13.0	9	17	20.2	10.4
Average		*12*	*17*	*26.0*	*19.0*	*11*	*17*	*25.0*	*17.0*
Sugar:									
Cuba	1903 to 1950	15	21	24.2	18.7	14	21	24.2	19.2
Indonesia	1902 to 1950	10	21	20.0	9.6	11	18	20.3	10.9
Mauritius	1902 to 1950	11	27	33.3	13.8	10	16	33.9	23.8
Philippines	1902 to 1950	11	24	32.8	15.6	11	18	30.5	21.9
Average		*12*	*22*	*25.0*	*15.0*	*12*	*19*	*24.0*	*17.0*

Table 23 (*continued*)

Commodity[a] and country	Period covered	Upswing: Number of upswings	Upswing: Total duration (years)	Upswing: Percentage increase: Total amplitude[b]	Upswing: Percentage increase: Rate per year	Downswing: Number of downswings	Downswing: Total duration (years)	Downswing: Percentage decrease: Total amplitude[c]	Downswing: Percentage decrease: Rate per year
Jute:									
India and Pakistan.	1902 to 1950	13	22	23.6	15.3	14	21	23.3	16.2
Copper:									
Chile	1902 to 1950	11	20	29.3	16.4	11	23	31.3	21.0
Mexico	1902 to 1950	12	18	32.5	23.0	11	25	14.9	6.2
Peru	1902 to 1950	10	23	22.7	10.6	11	20	21.5	14.3
Average		*11*	*20*	*29.0*	*18.0*	*11*	*23*	*21.0*	*12.0*
Petroleum:									
Mexico	1913 to 1950	9	23	29.5	10.9	9	20	26.5	14.6
Middle East	1914 to 1950	8	16	14.7	9.4	8	15	17.4	10.5
Iran	1914 to 1950	9	15	14.8	10.1	9	16	13.0	6.9
Romania	1913 to 1950	11	21	18.8	13.3	11	22	18.1	9.0
Average		*9*	*20*	*20.0*	*11.0*	*9*	*19*	*21.0*	*12.0*
Coffee:									
Brazil	1902 to 1950	13	21	24.2	16.7	14	22	21.5	14.5
Other countries	1902 to 1950	13	17	13.1	10.3	14	26	13.6	9.0
Average		*13*	*19*	*20.5*	*15.0*	*14*	*24*	*18.0*	*12.0*
Silk:									
Korea	1914 to 1939	5	10	15.4	9.4	5	14	16.0	5.9
Tea:									
Ceylon	1910 to 1950	12	18	8.9	7.0	13	17	7.7	6.0
China	1910 to 1950	9	17	38.2	27.4	9	15	34.5	21.3
India and Pakistan.	1910 to 1950	14	18	10.3	9.2	13	17	11.4	9.2
Average		*12*	*18*	*14.0*	*12.0*	*12*	*16*	*14.0*	*10.0*
Wool:									
Argentina	1923 to 1948	4	8	7.9	4.0	5	12	6.9	2.6
Uruguay	1923 to 1948	7	13	14.1	8.4	7	8	12.6	10.8
Average		*6*	*11*	*9.0*	*5.0*	*6*	*10*	*8.0*	*4.7*
AVERAGE, 18 COMMODITIES		*10*	*18*	*27.7*	*17.6*	*10*	*17*	*27.3*	*16.8*

[a] Listed in descending order of the total decline in volume.
[b] Increase from low point as a percentage of the high point.
[c] Percentage decrease from high point.

when annual rates of cyclical movement are considered, the difference between price fluctuations and volume fluctuations become more pronounced.[6] The average annual rate of increase in volume during the upswing was 17.6 per cent of the high point,[7] and the corresponding rate during the downswing was 16.8 per cent. Thus, cyclical variations in volume tended to be wider, though they were of shorter duration, than cyclical fluctuations in prices. Furthermore, variations in volume were greater than price changes in respect of year-to-year variations.

Table 23, which lists commodities in descending order of total amplitude of cyclical downswings in export volume, indicates that the range of total cyclical downswing is from 57 per cent in the case of wheat to 8 per cent for wool. Total decreases exceeded the average in the case of wheat, linseed, sodium nitrate, rice, hemp, cotton, rubber and tin. The greatest annual rates of decline — 20 per cent or over — were in wheat, linseed, sodium nitrate, rubber and cotton, in that order. Declines in cocoa, sugar, tin and tobacco were also somewhat above the average annual rate. The lowest annual rates were in wool (5 per cent) and silk (6 per cent); tea, hemp, coffee, copper, petroleum, jute and rice were also below the average.

There was a great deal of diversity among the underdeveloped countries listed in table 23. In the case of textile fibres, for example, all the cotton exporters,

[6] See table 11, above.
[7] Or 22 per cent, if measured conventionally from the low point.

except Egypt, show larger cyclical downswings in export volume than the average for all commodities. The greatest total fluctuation — 59 per cent — occurred in the case of Brazilian cotton. The export volume of wool from Uruguay tended to decline more than that from Argentina, but both fluctuated less than the average.

In the case of rubber, Indonesia and Malaya showed approximately the same loss of volume in trade cycles. Among tin exporters, however, considerable divergencies appeared. The losses ranged from 19 per cent in the case of Bolivia, to nearly twice as much in the case of Malaya. Tin exporters in Bolivia and Thailand lost less in export volume than the general average of 27 per cent; the others lost more. Copper exports showed noticeable differences and, with the exception of those from Chile, were below the average for all commodities. This was also true of petroleum, except that all exporters registered decreases below the average.

In the case of foods, both rice exporters listed in table 23 lost heavily in volume during downswings — Thailand more than Indochina. The volume of Brazilian coffee dropped more than that of other coffee exporters, though both groups lost less than the general average. The low average for tea was due entirely to the relative stability of Indian and Ceylonese export volume. Brazilian cocoa exports were less vulnerable to loss of volume than those of the Gold Coast or Trinidad. Philippine tobacco exports were more stable than those of Indonesia and Algeria. The range among sugar exporters was similar to that among tobacco exporters — from 20 per cent in the case of Indonesia to over 30 per cent for Mauritius.

In the case of linseed, the volume of Argentine exports was the most stable, though the rate of fluctuation per year was well above the general average for all commodities; the greater fluctuation in respect of this commodity, on an average, was largely due to considerable losses during downswings in the case of India and Pakistan and French Morocco.

Instances of relatively stable exports of generally vulnerable commodities were provided by cotton from Egypt and tin from Bolivia and Thailand. Instances of vulnerable exports of generally stable commodities were Chinese tea and Mexican petroleum.

Long-Term Trends

Table 24 summarizes data pertaining to annual changes due to long-term trends[8] in export volume in respect of the eighteen commodities for which annual and cyclical variations in quantity have already been examined. The commodities are listed in descending order of their vulnerability to a long-term falling trend, as measured by the annual rate of decline.

On the average, the total duration of upward long-term secular movements during this period was greater than that of downward movements in the ratio of about three to two.[9] In respect of long-term price trends, the ratio was also about three to two. The ratio of total amplitude[10] of upward phases to downward phases was the same as in the case of long-term price trends. Although long-term trends in volume, as well as in price, were predominantly upward during the period, the annual rate of change during the rising phases (4.0 per cent) was a little smaller than during the falling phases (4.3 per cent). The rate of rise varied from a maximum of 6.2 per cent per year (linseed) to a minimum of 2.0 per cent (hemp and wool); decreases varied from a maximum of 7.1 per cent per year in linseed to 2.2 per cent per year for cocoa and coffee, and none at all for silk. The annual rates of long-term changes in volume were not very different from those in price.

Table 24. Long-Term Trends in Export Volume, 1901 to 1950

(Average percentage fluctuation per year)

Commodity[a]	Rising phase		Falling phase	
	Number of years	Increase per year	Number of years	Decrease per year
Linseed	16	6.2	19	7.1
Rubber	28	5.2	8	6.6
Sodium nitrate	17	5.3	18	5.7
Wheat	17	5.6	18	5.7
Petroleum	29	4.1	8	5.1
Jute	19	4.6	24	4.8
Rice	19	4.1	13	4.8
Sugar	28	3.9	13	4.8
Tin	24	4.8	18	4.3
Cotton	20	4.8	19	4.2
Tea	20	2.9	15	3.9
Tobacco	17	4.5	15	3.8
Copper	29	4.1	12	3.5
Wool	19	2.0	4	2.7
Hemp	11	2.0	4	2.3
Cocoa	25	3.5	10	2.2
Coffee	31	2.3	13	2.2
Silk	34	2.8	—	—
AVERAGE, 18 COMMODITIES	*22*	*4.0*	*14*	*4.3*

[a] Arranged in descending order of average decline per year.

[8] Measured by seven-year moving average.

[9] Jute, linseed, sodium nitrate and wheat were the only commodities with more years of falling trend, as measured by the seven-year moving average, during the period studied.

[10] Not shown in table 24.

Interrelation of Year-to-Year, Cyclical and Long-Term Fluctuations

The three major types of fluctuation in volume — year-to-year, cyclical and long-term — which have been analysed separately in this chapter showed marked correlation (as in the case of prices), in that commodities tended to be similarly stable, or unstable, in respect of the three types (see table 25). This was indicated by the fact that for the eighteen commodities analysed in respect of fluctuations in volume, the coefficient of correlation in rank between year-to-year volume changes and total amplitude of cyclical downswings was +0.86, indicating a close relation. The coefficient of correlation in rank for the eighteen commodities in respect of year-to-year volume changes and annual rate of falling long-term trends was +0.83, similarly indicating a close relation. The coefficient of correlation between the amplitude of cyclical downswing and falling long-term trends was +0.62, indicating some, though less close, relation. The results thus suggest that instability in export volume is largely determined by market conditions for particular commodities, and that these conditions tend to make the same commodities stable, or unstable, in respect of year-to-year, cyclical or long-term fluctuations.

Table 25. Year-to-Year, Cyclical and Long-Term Fluctuations in Export Volume, 1901 to 1950

(Average percentage fluctuation per year)

Commodity and country	Year-to-year	Cyclical[a]		Long-term	
		Upswing	Downswing	Rising phase	Falling phase
Cocoa:					
Brazil	16.0	18.7	15.8	2.9	2.8
Gold Coast	16.2	18.4	18.8	3.7	2.7
Trinidad and Tobago	22.8	24.8	24.3	2.9	0.3
Average	*16.7*	*19.0*	*19.0*	*3.5*	*2.2*
Coffee:					
Brazil	16.4	16.7	14.5	2.4	2.3
Other countries	8.3	10.3	9.0	2.1	1.1
Average	*12.4*	*15.0*	*12.0*	*2.3*	*2.2*
Copper:					
Chile	16.1	16.4	21.0	4.0	2.6
Mexico	18.5	23.0	6.2	3.1	3.6
Peru	11.9	10.6	14.3	6.9	4.5
Average	*16.3*	*18.0*	*12.0*	*4.1*	*3.5*
Cotton:					
Brazil	46.0	46.8	41.3	7.9	3.1
China	28.9	25.2	26.9	7.7	3.2
Egypt	14.2	13.1	16.7	3.6	4.6
India	22.5	18.2	18.7	5.1	4.1
Peru	20.1	22.2	26.3	3.2	4.5
Average	*21.3*	*19.0*	*20.0*	*4.8*	*4.2*
Hemp:					
Philippines	16.5	12.0	10.8	2.0	2.3
Jute:					
India and Pakistan	16.8	15.3	16.2	4.6	4.8
Linseed:					
Argentina	29.0	24.6	23.9	4.5	4.3
India and Pakistan	36.3	34.8	40.7	5.5	6.5
Morocco, French	41.8	41.2	36.6	6.5	7.7
Average	*31.1*	*27.0*	*28.0*	*6.2*	*7.1*
Petroleum:					
Mexico	21.6	10.9	14.6	4.9	5.9
Middle East	16.5	9.4	10.5	3.2	—[b]
Iran	14.2	10.1	6.9	3.1	—[b]
Romania	15.6	13.3	9.0	6.5	3.9
Average	*18.1*	*11.0*	*12.0*	*4.1*	*5.1*

Table 25 (*continued*)

Commodity and country	Year-to-year	Cyclical[a]		Long-term	
		Upswing	Downswing	Rising phase	Falling phase
Rice:					
Indochina	18.1	16.8	16.9	3.6	3.4
Thailand	23.2	29.9	15.9	4.7	6.3
Average	*20.7*	*23.0*	*16.4*	*4.1*	*4.8*
Rubber:					
Indonesia	28.6	26.6	22.6	5.2	8.3
Malaya	29.4	23.1	19.2	5.1	6.0
Average	*29.0*	*25.0*	*21.0*	*5.2*	*6.6*
Silk:					
Korea	13.4	9.4	5.9	2.8	—[b]
Sodium nitrate:					
Chile	22.3	23.5	25.0	5.3	5.7
Sugar:					
Cuba	17.0	18.7	19.2	4.1	3.0
Indonesia	17.2	9.6	10.9	3.1	5.8
Mauritius	17.9	13.8	23.8	3.0	2.7
Philippines	23.4	15.6	21.9	5.1	8.7
Average	*18.3*	*15.0*	*17.0*	*3.9*	*4.7*
Tea:					
Ceylon	5.6	7.0	6.0	2.0	1.7
China	21.5	27.4	21.3	10.9	5.8
India and Pakistan	9.7	9.2	9.2	1.7	1.1
Average	*10.3*	*12.0*	*10.0*	*2.9*	*3.9*
Tin:					
Belgian Congo	25.9	15.2	22.6	7.5	5.9
Bolivia	11.1	10.9	8.3	3.4	3.9
Indonesia	19.6	19.4	18.3	3.8	7.3
Malaya	18.0	17.7	20.1	7.3	4.0
Nigeria	21.2	13.2	23.4	4.3	4.4
Thailand	15.7	9.9	9.9	5.1	1.5
Average	*17.5*	*16.0*	*17.0*	*4.8*	*4.3*
Tobacco:					
Algeria	22.6	24.4	25.4	4.0	2.9
Indonesia	15.7	20.6	18.7	4.6	4.7
Philippines	12.4	13.0	10.4	4.8	3.3
Average	*15.8*	*19.0*	*17.0*	*4.5*	*3.8*
Wheat:					
Argentina	33.3	31.8	39.2	5.6	5.7
Wool:					
Argentina	4.8	4.0	2.6	1.9	2.0
Uruguay	9.6	8.4	10.8	2.9	4.1
Average	*6.0*	*5.0*	*4.7*	*2.0*	*2.7*
AVERAGE, 18 COMMODITIES	*±18.7*	*+17.6*	*−16.8*	*+4.0*	*−4.3*

[a] See table 23 for total amplitude of upswing and downswing.
[b] No falling phase was recorded.

This correlation is confirmed by more detailed study of particular commodities. Of the eighteen primary commodities covered, year-to-year fluctuations in volume were greater than the average in six cases, and were smaller in twelve. Five of the six commodities with year-to-year fluctuations above the average also had above-average cyclical downswings in volume. Of the twelve commodities with year-to-year fluctuations below the average, all except four also had below-average cyclical downswings. Thus, of the eighteen commodities, thirteen were above or below average in both respects.

In comparing year-to-year changes in volume with the annual rate of secular change during falling long-term phases, it was also found that five commodities which were less stable than the average in respect of year-to-year fluctuations were also unstable in respect of long-term trends. Conversely, of the twelve commodities in which year-to-year fluctuations were below the average, all but four were also below the average in annual rates of decrease due to long-term factors. The relation of thirteen of the eighteen commodities to the average was similar in both respects.

Of the nine commodities which showed cyclical downswings above the average, five also showed above-average rates of decline in long-term trends. Of the nine commodities which were below the average in cyclical downswings, six were also below the average in rate of falling long-term trend. Again, of the eighteen commodities covered, eleven were relatively stable or relatively unstable in both respects.

As further evidence of the relation among different types of fluctuation in volume of exports, four of the eighteen commodities were relatively unstable in all three respects (year-to-year, cyclical and long-term fluctuations), and six were relatively stable in all three respects. The commodities with above-average instability were linseed, rubber, sodium nitrate and wheat; and rubber was also found to have been unstable in respect of all three types of price fluctuation.[11] The six stable commodities were coffee, copper, hemp, silk, tea and wool. Of these commodities, copper was also found to be relatively stable in respect of all three types of price fluctuation.[11]

[11] See chapter 2.

Chapter 4

FLUCTUATIONS IN EXPORT PROCEEDS

In chapters 2 and 3, year-to-year, cyclical and long-term fluctuations and their interrelation have been examined in detail with respect to price and volume separately. The same analytical treatment is extended to fluctuations in export proceeds of under-developed countries in the present chapter. In chapter 5, the relationship among fluctuations in price, volume and proceeds is considered in greater detail.

Year-to-Year Fluctuations

Table 26 shows the year-to-year fluctuations of export proceeds, by periods, for the eighteen commodities exported by selected under-developed countries. The commodities are listed in descending order of their vulnerability to year-to-year fluctuations in total proceeds over the period as a whole.

Table 26. Year-to-Year Fluctuations in Export Proceeds,[a] by Periods

(Average percentage fluctuation per year)

Commodity and country	Period covered	Peace-time period			War period		Full period
		1901 to 1913	1920 to 1939	1946 to 1950	1914 to 1919	1940 to 1945	
Rubber:							
Indonesia	1911 to 1950	28.0	35.3	38.4	27.8	44.0	35.3
Malaya	1906 to 1949	47.3	33.7	36.4	25.3	42.7	36.5
Average		*38.7*	*34.4*	*37.4*	*26.4*	*43.3*	*35.9*
Wheat:							
Argentina	1914 to 1950	..	36.1	31.3	41.5	16.5	33.1
Linseed:							
Argentina	1904 to 1946	16.8	14.9	73.0[b]	47.8	37.0	24.4
India and Pakistan	1904 to 1950	33.1	45.1	29.6	12.4	32.8	35.2
Morocco, French	1910 to 1950	51.3	29.2	63.0[c]	56.5	73.2	44.8
Average		*21.8*	*21.4*	*64.2*	*41.6*	*38.3*	*27.6*
Cotton:							
Brazil	1904 to 1950	37.5	44.4	38.6	54.0	20.7	40.5
China	1904 to 1944	29.2	30.2	..	28.0	61.2	33.4
Egypt	1904 to 1950	10.4	19.0	37.0	22.3	18.8	19.5
India and Pakistan	1904 to 1950	17.8	26.8	47.6	28.3	29.0	27.6
Peru	1905 to 1950	26.0	16.4	40.6	31.3	44.0	26.5
Average		*17.5*	*24.8*	*42.9*	*27.9*	*27.8*	*25.9*
Tin:							
Belgian Congo	1917 to 1950	..	34.6	15.0	54.2	12.5	30.9
Bolivia	1902 to 1950	15.9	22.7	15.9	19.3	9.9	18.4
Indonesia	1902 to 1950	13.3	22.7	44.7	15.3	56.5	25.9
Malaya	1902 to 1950	11.6	26.1	46.4	10.8	56.7	26.5
Nigeria	1904 to 1950	61.1	25.7	13.9	12.8	8.5	28.1
Thailand	1902 to 1950	15.0	22.7	42.6	12.7	30.0	22.5
Average		*17.1*	*25.0*	*34.7*	*17.0*	*38.1*	*24.8*
Sugar:							
Cuba	1903 to 1950	25.4	17.7	19.2	22.3	26.8	21.3
Indonesia	1902 to 1950	17.4	24.3	51.0[d]	18.3	32.2	24.2
Mauritius	1902 to 1950	23.7	28.5	22.4	13.8	22.0	24.1
Philippines	1902 to 1950	24.2	28.4	45.6	17.2	52.3	30.8
Average		*22.8*	*21.8*	*34.0*	*20.1*	*33.5*	*24.1*

Table 26 (*continued*)

Commodity and country	*Period covered*	*Peace-time period*			*War period*		*Full period*
		1901 to 1913	*1920 to 1939*	*1946 to 1950*	*1914 to 1919*	*1940 to 1945*	
Sodium nitrate:							
Chile	1914 to 1950	..	24.7	14.4	30.5	11.8	22.2
Jute:							
India and Pakistan	1902 to 1950	16.1	19.4	28.0	32.2	27.0	22.0
Hemp:							
Philippines	1920 to 1950	..	21.1	30.3[c]	..	13.0	21.9
Copper:							
Chile	1902 to 1950	14.3	27.3	21.1	24.2	8.5	20.8
Mexico	1902 to 1950	15.0	29.2	12.6	32.7	15.0	22.7
Peru	1902 to 1950	19.1	20.6	18.2	25.5	7.5	19.0
Average		*15.2*	*26.9*	*16.1*	*26.8*	*10.2*	*21.3*
Rice:							
Indochina	1914 to 1950	..	17.3	49.7[c]	11.5	24.3	20.8
Thailand	1914 to 1950	..	16.8	45.4	7.8	30.0	21.3
Average		..	*17.1*	*47.6*	*9.7*	*27.2*	*21.1*
Coffee:							
Brazil	1902 to 1950	19.3	13.1	25.0	34.3	18.5	19.1
Other countries	1902 to 1950	13.7	27.4	27.2	22.3	16.2	22.0
Average		*17.4*	*17.9*	*26.1*	*30.3*	*17.7*	*20.6*
Cocoa:							
Brazil	1910 to 1950	14.5	10.9	24.9	23.3	21.9	16.4
Gold Coast	1910 to 1950	19.8	18.8	20.2	27.3	18.8	20.3
Trinidad and Tobago	1910 to 1950	14.8	24.7	48.0	19.5	22.3	25.5
Average		*18.1*	*17.3*	*23.7*	*25.7*	*25.7*	*19.8*
Petroleum:							
Mexico	1913 to 1950	21.0	18.2	21.0	14.7	8.8	16.6
Middle East	1914 to 1950	..	19.0	29.9	20.8	20.7	21.0
Iran	1914 to 1950	..	17.5	21.4	21.0	19.8	19.0
Romania	1913 to 1950	18.0	16.8	20.6	30.8	13.7	19.1
Average		*20.0*	*18.4*	*25.4*	*20.4*	*15.6*	*19.2*
Silk:							
Korea	1914 to 1939	..	15.7	..	28.2	..	19.2
Tobacco:							
Algeria	1902 to 1950	17.8	25.8	22.7	20.5	25.8	22.9
Indonesia	1902 to 1938	17.0	16.9	..	13.8	..	16.4
Philippines	1904 to 1950	13.5	17.6	23.4	20.8	..	17.8
Average		*16.0*	*18.6*	*23.2*	*17.3*	*25.8*	*18.0*
Wool:							
Argentina	1923 to 1948	..	18.0	6.1[e]	..	8.8	14.5
Uruguay	1923 to 1948	..	19.1	13.4[e]	..	12.1	16.8
Average		..	*18.3*	*7.9*	..	*9.6*	*15.1*
Tea:							
Ceylon	1910 to 1950	6.3	13.6	11.3	8.2	15.7	12.1
China	1910 to 1950	2.5	20.1	28.2[c]	28.5	53.4	24.7
India and Pakistan	1910 to 1950	7.8	12.6	21.5	12.3	14.3	13.4
Average		*6.4*	*14.2*	*19.2*	*13.6*	*21.3*	*14.9*
AVERAGE, 18 COMMODITIES		*±18.9*	*±21.8*	*±29.8*	*±25.6*	*±23.7*	*±22.6*

Source: See appendix A.

[a] Averages weighted according to the relative share of the individual countries in total exports.

[b] 1946.

[c] 1947 to 1950.

[d] 1949 to 1950.

[e] 1946 to 1948.

During the full period covered, export earnings included in this analysis fluctuated from year to year by an average of 22.6 per cent. In other words, the average fluctuations in earnings from the export of a primary commodity would be from 100 one year to either 77 or 130[1] the next year, with the possibility that total earnings might actually be lower than 77 or higher than 130 and the range wider than that suggested by ±22.6.

The average of 22.6 per cent is higher than the average year-to-year fluctuations of import unit values alone, 13.7 per cent.[2] It is also higher than the year-to-year fluctuations in export volume, 18.7 per cent.[3] The most important conclusion that may be drawn is that the year-to-year fluctuations in unit value or price on the one hand, and those in quantities exported on the other hand, had a tendency to react together and thus resulted in fluctuations in export receipts greater than could be accounted for by either of the two factors individually. It is also apparent that the tendency of prices and quantities to fluctuate in the same direction from year to year has not been consistent. Otherwise, fluctuations in total export proceeds would have been much greater — over 30 per cent each year instead of 23 per cent.[4] At any rate, it is obvious that an average fluctuation of this amount, and more specifically an average drop from one year to another in export receipts of 23 per cent in years of downward fluctuations, is bound to have a detrimental effect on the prospects for regular and high rates of investment in under-developed countries.

The analysis by periods shows that, for all commodities taken together, the year-to-year fluctuations in export proceeds of under-developed countries were a little higher in the period between the two wars than they had been before 1914, but increased sharply in the period after the Second World War. During that war, fluctuations in earnings were a little less than during the First World War; the reduction, however, was less than the reduction in the degree of price fluctuations.[5] It thus appears that the stabilization achieved in the war period 1940 to 1945 was a stabilization of prices more than of export earnings. Moreover, even during the war, the year-to-year changes in export receipts of under-developed countries were greater than in the period 1920 to 1939, in spite of reduced price fluctuations. The general result was a fairly constant degree of year-to-year fluctuation in total export earnings from the beginning of the century to the end of the Second World War, with greatly increased fluctuations since.

Among different commodities, the average for the full period varied from less than 15 per cent for tea to 35.9 per cent for rubber. It is unnecessary to emphasize the extreme instability which a variation of about 36 per cent denotes for rubber exporters. Other commodities especially vulnerable to year-to-year fluctuations in proceeds — fluctuations of over 25 per cent — were wheat, linseed and cotton, in that order. The most stable commodities in addition to tea were wool, tobacco, silk, petroleum and cocoa, all of them fluctuating by less than 20 per cent.

Certain commodities showed a continuous increase in year-to-year instability of export earnings throughout the three peace-time periods. Among these were jute, cotton, tobacco, coffee, tea and tin. No commodity experienced a steady decrease in instability during these three periods.

Increased instability in export earnings was clearly evident in several commodities, for example, sugar and tin during the Second World War and the post-war period; cotton, hemp, linseed and petroleum in the post-war period. By contrast, a steady decrease in instability was evident in the earnings from nitrate from 1914 to 1945, while considerable stability of earnings from copper and wool[6] has been achieved since the Second World War. Examination of individual exporters of particular commodities for the full period revealed the following noteworthy features: special instability was experienced in earnings from tea exported by China, in contrast to relative stability for tea exported by India and Ceylon; Cuban sugar proceeds were more stable than proceeds from Philippine sugar; Egyptian earnings from cotton were relatively stable when compared with Brazilian earnings; earnings from Argentine linseed exports varied less on the average than those of India or Morocco; earnings from Bolivian tin exports were more stable than earnings of other exporters of tin; Brazilian coffee and cocoa earnings were relatively more stable than those of other exporters, as were Mexican petroleum earnings, Indonesian and Philippine tobacco earnings. Both rubber exporters experienced practically equal instability, and both wool exporters equal stability.

Details of year-to-year fluctuations in total export proceeds are available in table I in appendix D for a large number of subdivisions of commodities sold by under-developed countries in the United States market. The average year-to-year fluctuation in export proceeds for those listed was 37.4 per cent for the period ending in 1939, and 38.7 per cent for the full period ending in 1949. If only declines in proceeds are taken into account, the average decrease in export earnings for the period ending in 1939 was slightly less, 36.2 per cent. The magnitude of this figure is indicative of extreme instability in year-to-year earnings in respect of

[1] A drop of 23 per cent is equivalent to a rise of 30 per cent from the low point, using the conventional measure. For the purposes of this study, all changes have been expressed as a percentage of the high point.

[2] See chapter 2.

[3] See chapter 3.

[4] This problem is discussed in greater detail in chapter 5.

[5] For comparative data on year-to-year fluctuations in price, volume and proceeds, see chapter 5.

[6] Only in the case of exports from under-developed countries.

subvarieties when compared with an average fluctuation of 22.6 per cent for primary commodities sold in all markets. This is suggestive of the increased risk involved in the sale of specific grades or types of a particular commodity in a single market. In addition to the fluctuations common to a primary commodity, there were fluctuations arising from shifts away from one particular type to another type of the same commodity. Since, as shown earlier, the difference in the case of unit value fluctuations was fairly small, it is evident that the additional instability was caused by greater fluctuations in the volume of sales of specific subclassifications. Although actual calculations were not made, year-to-year changes in export quantities for the subdivisions of commodities given in appendix table I appear to have averaged about 30 per cent — significantly greater than the 18.7 per cent average fluctuation in volume for the more broadly defined commodities. Thus, the degree of instability suggested by fluctuations in earnings from commodities as a whole represents an understatement, since fluctuations in earnings of exporters dependent on a narrow group or type of subclassification are appreciably greater.

The frequency distribution, according to average year-to-year percentage decline in proceeds from exports to the United States market, of 170 items analysed in table III in appendix D, in respect of years of falling proceeds, is shown in table 27.

Table 27. Frequency Distribution of Year-to-Year Decreases in Proceeds of Exports to the United States

Average decrease per year	*Number of items*	*Per cent of total*
0 to 9.9	2	1
10 to 19.9	16	9
20 to 29.9	43	25
30 to 39.9	45	27
40 to 49.9	35	21
50 to 59.9	19	11
60 and over	10	6
TOTAL	170	100

The simple average for the 170 series was 36.2 per cent. The mean, the median and the mode all fell between 30 per cent and 39.9 per cent, and within a range of 5 per cent. The modal class (30 to 40 per cent) consisted of over one-quarter of the series analysed. The average annual downward variation in proceeds was thus very marked. A decline in any year of more than one-third from the level of proceeds in the preceding year indicates extraordinary unsteadiness in the export earnings of an under-developed country. For twenty-nine items, about one-sixth of the total, the average percentage decline exceeded 50 per cent, in some cases considerably. In contrast, only two items showed a downward fluctuation which may be considered small (under 10 per cent) — Colombian coffee and bauxite from Surinam. The five items which experienced the greatest average year-to-year drop in proceeds were carpet wool (China); wool (Argentina); coffee (Angola); cane sugar (Dominican Republic); and tin bars (China).

Export receipts of under-developed countries included in the forty-seven case studies were also examined according to regional groupings in respect of the eighteen major primary commodities; average year-to-year fluctuations of proceeds from these commodities are given in table 28. Where the export receipts were derived from more than one commodity, the average — except for Mexico and Peru — represents a weighted average based on the relative importance of these commodities in the immediate pre-war export trade of the country.

Regional differences in year-to-year fluctuations of price, volume and proceeds are summarized below:

	Year-to-year fluctuations		
Exporting region	*Prices*	*Volume*	*Proceeds*
Africa	14.7	24.3	28.5
Asia	14.4	19.4	24.2
Latin America	14.3	18.2	22.2
Middle East	14.0	15.4	20.3
AVERAGE, ABOVE REGIONS	*14.4*	*19.3*	*23.8*

The under-developed countries in Africa experienced the greatest year-to-year fluctuations in their total export receipts in respect of the major primary commodities. The countries of Asia also exhibited year-to-year fluctuations above the average for all under-developed countries, though in lesser degree. In Latin America and the Middle East, fluctuations were below the average.

Of the individual countries listed in table 28, four out of six African countries registered above-average fluctuations in total export proceeds; only cocoa exports from the Gold Coast and tobacco exports from Algeria were below the average. Of the Asian countries, four showed above-average fluctuations in total proceeds; these were China, Indonesia, Malaya and the Philippines. Of the Latin American countries, the following had above-average fluctuations: Argentina, Brazil, Peru, and Trinidad and Tobago. The Middle East countries recorded below-average fluctuations in total receipts.

The commodities which figured prominently in producing above-average fluctuations in export proceeds for the African countries were linseed, sugar and tin; for the countries of Asia, cotton, rubber, sugar and tin; for the Latin American region, cotton, linseed and wheat.

The experience of under-developed regions in respect of their aggregate proceeds from exports to the United States market also evidences the wide fluctuations in their foreign exchange earnings. Based on United States imports, the year-to-year fluctuations of total

Table 28. Year-to-Year Fluctuations in Export Proceeds, by Countries and Regions

(Average percentage fluctuation per year)

Country and commodity	Period covered	Year-to-year fluctuation in export proceeds
AFRICA		
Morocco, French:		
Linseed	1910 to 1950	44.8
Belgian Congo:		
Tin	1917 to 1950	30.9
Nigeria:		
Tin	1904 to 1950	28.1
Mauritius:		
Sugar	1902 to 1950	24.1
Algeria:		
Tobacco	1902 to 1950	22.9
Gold Coast:		
Cocoa	1910 to 1950	20.3
ASIA		
Malaya:		
Rubber	1906 to 1949	36.5
Tin	1902 to 1950	26.5
Average		*33.6*
China:		
Cotton	1904 to 1944	33.4
Tea	1910 to 1950	24.7
Average		*31.2*
Indonesia:		
Rubber	1911 to 1950	35.3
Tin	1902 to 1950	25.9
Sugar	1902 to 1950	24.2
Tobacco	1902 to 1938	16.4
Average		*29.0*
Philippines:		
Sugar	1902 to 1950	30.8
Hemp	1920 to 1950	21.9
Tobacco	1904 to 1950	17.8
Average		*28.7*
India and Pakistan:		
Linseed	1904 to 1950	35.2
Cotton	1904 to 1950	27.6
Jute	1902 to 1950	22.0
Tea	1910 to 1950	13.4
Average		*21.7*
Thailand:		
Tin	1902 to 1950	22.5
Rice	1914 to 1950	21.3
Average		*21.6*
Indochina:		
Rice	1914 to 1950	20.8
Korea:		
Silk	1914 to 1939	19.2
Ceylon:		
Tea	1910 to 1950	12.3
LATIN AMERICA		
Argentina:		
Wheat	1914 to 1950	33.1
Linseed	1904 to 1946	24.4
Wool	1923 to 1948	14.5
Average		*27.4*
Peru:		
Cotton	1905 to 1950	26.5
Copper	1902 to 1950	19.0
Average		*26.4*
Trinidad and Tobago:		
Cocoa	1910 to 1950	25.5
Brazil:		
Cotton	1904 to 1950	40.5
Coffee	1902 to 1950	19.1
Cocoa	1910 to 1950	16.4
Average		*24.6*
Chile:		
Sodium nitrate	1914 to 1950	22.2
Copper	1902 to 1950	20.8
Average		*21.3*
Cuba:		
Sugar	1903 to 1950	21.3
Bolivia:		
Tin	1902 to 1950	18.4
Mexico:		
Copper	1902 to 1950	22.7
Petroleum	1913 to 1950	16.6
Average		*18.1*
Uruguay:		
Wool	1923 to 1948	16.8
MIDDLE EAST		
All countries:		
Petroleum	1914 to 1950	21.0
Egypt:		
Cotton	1904 to 1950	19.5

export proceeds[7] during the period 1923 to 1939 averaged as follows:

Exporting region	*Year-to-year fluctuations in export proceeds*
All countries	15.8
Latin America	14.3
Oversea sterling area	29.0
Other under-developed areas	15.6

These figures show that again average fluctuations are smaller when groups of countries or commodities, rather than individual countries or commodities or their subdivisions are considered. The figure for United States imports from all countries, and those from Latin America and other under-developed countries outside the oversea sterling area, are all much below the average of 22.6 per cent computed for individual primary commodities. In contrast, the position of the oversea sterling area — even when considered as a whole — is more vulnerable than the average. It may be noted that the figure of 29 per cent for the oversea sterling area is close to the average of the two commodities, rubber and tin, in table 26 above. Both commodities, the two major exports of the oversea sterling area to the United States, are above the average in vulnerability to fluctuations in proceeds.

Cyclical Movements

The duration and magnitude of cyclical fluctuations in earnings from exports of selected primary products are given in table 29. During the period reviewed there were, on an average, nine cycles, and the average duration of each upswing or downswing was about two years. The commodities considered in table 29 are listed in descending order of their vulnerability to cyclical downswings.

The amplitude of cyclical fluctuations in export proceeds, whether upward or downward, averaged about 37 per cent. In the case of countries whose export data were examined, export earnings from the sale of these specific primary commodities were thus reduced in cyclical downswings by no less than one-third on an average, within a period of less than two years. Similarly, in an upswing, earnings were increased on an average by 59 per cent, as conventionally measured.[8] The range in fluctuations would of course be much wider than the average of ±37 per cent.

The amplitude of cyclical fluctuations in export earnings was considerably greater than that found in cyclical fluctuations in prices[9] and volume.[10] The average of about 37 per cent compares with figures of 26 to 27 per cent for unit values or prices and 27 to 28 per cent for quantities. It is thus evident that the cyclical movements of prices and quantities have tended to coincide in direction so that the resulting cyclical fluctuations in export earnings have been greater than those of either export unit values or export volume alone. However, as in the case of year-to-year fluctuations, the coincidence, while marked, was by no means consistent. Some fluctuations in volume were in opposite directions, and the cyclical fluctuations in receipts were distinctly less than they would have been if the movements of prices and volume had always coincided.

The range of cyclical downswings in proceeds was from 50 per cent for linseed to 23 per cent for tea. The earnings of linseed exporters might therefore be reduced by one-half during one downswing, then doubled in the following upswing, with some cycles showing even more violent fluctuations. Since table 29 is arranged in descending order of total amplitude of cyclical downswings, the commodities in the upper half of the table are the most vulnerable in this respect. Cotton and rubber, which have appeared in other tables as especially vulnerable, are again above the average.

Among the individual exporters represented in table 29, the extremes ranged from 65 per cent in the case of French Morocco (linseed) and 56.5 per cent (India and Pakistan, linseed) to 18.8 per cent (Ceylon, tea). The comments in the paragraphs which follow relate only to downswings.

Textile fibres: Among cotton exporters, Egypt was less vulnerable to fluctuations than the other exporters; China much more vulnerable. All cotton exporters, however, had a greater amplitude of cyclical downswing than the average for the eighteen commodities. Hemp was unstable in earning foreign exchange for the Philippines, but proceeds from jute were relatively stable in the case of India and Pakistan. Among proceeds from wool, Argentine earnings were more stable than Uruguay's, though this difference disappeared when annual rates of decline were considered, since Uruguay lost more because of longer downswings. Neither country was conspicuously vulnerable in relation to the average for all commodities. Among the textile fibres instability was greatest in cotton and hemp.

Other agricultural products: Coffee exporters other than Brazil were in a less vulnerable position than Brazil. Among tea exporters, India and Ceylon had

[7] Based on data contained in study by J. H. Adler, E. R. Schlesinger and E. Van Westerborg, "Indexes of United States Imports by Geographical Areas and Commodity Classification, 1923-1949". See footnote 8 in chapter 2.

[8] A rise from 100 to 159 corresponds to an increase of 37 per cent on the measure used in this study.

[9] See chapter 2.

[10] See chapter 3.

Table 29. Cyclical Movements in Export Proceeds, 1901 to 1950

Commodity[a] and country	Period covered	Upswing				Downswing			
		Number of upswings	Total duration (years)	Percentage increase: Total amplitude[b]	Percentage increase: Rate per year	Number of downswings	Total duration (years)	Percentage decrease: Total amplitude[c]	Percentage decrease: Rate per year
Linseed:									
Argentina	1904 to 1946	8	20	46.7	20.0	7	17	47.3	21.6
India and Pakistan	1904 to 1950	14	22	54.9	36.1	13	19	56.5	42.8
Morocco, French	1910 to 1950	9	19	63.9	40.9	9	13	65.0	50.0
Average		*10*	*20*	*49.0*	*24.0*	*10*	*16*	*50.0*	*27.0*
Wheat:									
Argentina	1914 to 1950	11	15	51.0	42.0	12	19	47.3	33.1
Hemp:									
Philippines	1920 to 1950	3	10	43.5	11.7	3	6	45.6	27.2
Sodium nitrate:									
Chile	1914 to 1950	9	17	42.1	26.3	9	18	44.0	32.4
Cotton:									
Brazil	1904 to 1950	15	19	51.3	42.3	14	22	42.4	28.9
China	1904 to 1944	8	17	55.9	32.9	7	18	54.7	23.6
Egypt	1904 to 1950	10	21	37.1	17.6	9	20	38.6	18.7
India and Pakistan	1904 to 1950	12	21	39.7	26.5	11	19	42.0	25.3
Peru	1905 to 1950	11	23	38.7	25.3	11	16	42.6	32.2
Average		*11*	*20*	*40.0*	*25.0*	*10*	*19*	*42.0*	*24.0*
Rubber:									
Indonesia	1911 to 1950	9	17	52.8	28.8	10	17	46.1	28.1
Malaya	1906 to 1949	10	24	53.8	24.4	9	15	37.7	28.0
Average		*9*	*21*	*53.0*	*26.0*	*10*	*16*	*42.0*	*28.0*
Copper:									
Chile	1902 to 1950	8	16	52.3	30.1	9	21	40.5	18.6
Mexico	1902 to 1950	12	21	43.9	28.6	11	22	40.2	21.7
Peru	1902 to 1950	11	24	34.6	18.3	11	19	29.7	19.0
Average		*10*	*20*	*44.0*	*26.0*	*10*	*21*	*38.0*	*20.0*
Tin:									
Belgian Congo	1917 to 1950	8	16	38.0	21.1	8	15	40.2	30.2
Bolivia	1902 to 1950	11	23	30.5	14.5	10	20	30.9	16.2
Indonesia	1902 to 1950	11	27	42.6	21.2	11	16	33.9	25.2
Malaya	1902 to 1950	10	24	41.4	21.3	10	18	43.2	26.0
Nigeria	1904 to 1950	9	26	47.0	23.4	9	17	47.7	33.9
Thailand	1902 to 1950	10	22	33.0	17.2	10	21	35.3	17.0
Average		*10*	*23*	*39.0*	*20.0*	*10*	*18*	*38.0*	*24.0*
Cocoa:									
Brazil	1910 to 1950	11	16	35.3	27.2	10	18	34.8	20.2
Gold Coast	1910 to 1950	9	20	35.1	23.1	8	15	38.0	23.0
Trinidad and Tobago	1910 to 1950	11	15	29.9	23.9	10	17	40.2	28.3
Average		*10*	*17*	*35.0*	*24.0*	*9*	*17*	*37.0*	*23.0*
Silk:									
Korea	1914 to 1939	4	12	39.5	23.6	4	12	36.7	19.3
Jute:									
India and Pakistan	1902 to 1950	11	24	37.3	20.3	12	19	33.7	23.7
Rice:									
Indochina	1914 to 1950	7	14	29.8	13.2	6	13	33.0	14.6
Thailand	1914 to 1950	10	17	33.6	22.5	9	16	33.3	19.3
Average		*9*	*16*	*32.0*	*18.0*	*8*	*15*	*33.0*	*17.0*
Sugar:									
Cuba	1903 to 1950	14	22	32.3	22.6	14	20	30.5	24.1
Indonesia	1902 to 1950	10	18	31.6	17.8	11	20	30.8	15.5
Mauritius	1902 to 1950	11	21	46.0	24.5	10	22	46.7	24.4
Philippines	1902 to 1950	11	24	43.6	21.7	11	18	42.0	29.0
Average		*12*	*21*	*34.0*	*21.0*	*13*	*19*	*33.0*	*23.0*

Table 29 (*continued*)

Commodity[a] and country	Period covered	Upswing: Number of upswings	Upswing: Total duration (years)	Upswing: Percentage increase: Total amplitude[b]	Upswing: Percentage increase: Rate per year	Downswing: Number of downswings	Downswing: Total duration (years)	Downswing: Percentage decrease: Total amplitude[c]	Downswing: Percentage decrease: Rate per year
Coffee:									
Brazil	1902 to 1950	12	26	32.0	18.3	11	17	32.9	22.9
Other countries	1902 to 1950	11	21	27.9	17.7	11	22	28.4	13.5
Average		*12*	*24*	*30.0*	*18.0*	*11*	*19*	*31.0*	*20.0*
Petroleum:									
Mexico	1913 to 1950	8	15	23.6	13.1	7	17	25.5	11.6
Middle East	1914 to 1950	7	12	25.3	16.3	6	19	29.7	8.9
Iran	1914 to 1950	9	12	20.2	15.9	8	19	21.4	8.1
Romania	1913 to 1950	8	15	29.5	19.2	8	17	31.9	17.7
Average		*8*	*14*	*25.0*	*16.0*	*7*	*18*	*29.0*	*11.0*
Tobacco:									
Algeria	1902 to 1950	15	17	32.3	29.5	14	24	30.5	20.7
Indonesia	1902 to 1938	9	13	24.3	17.9	8	16	29.1	19.1
Philippines	1904 to 1950	8	14	23.8	12.2	8	16	27.3	14.9
Average		*11*	*15*	*25.0*	*18.0*	*9*	*17*	*29.0*	*18.0*
Wool:									
Argentina	1923 to 1948	5	8	25.4	16.0	6	12	24.6	14.6
Uruguay	1923 to 1948	4	11	36.1	14.9	4	9	33.4	14.1
Average		*5*	*9*	*28.0*	*15.7*	*6*	*11*	*27.0*	*14.5*
Tea:									
Ceylon	1910 to 1950	10	18	19.3	9.3	10	17	18.8	9.9
China	1910 to 1950	8	15	36.5	24.2	9	17	38.8	19.1
India and Pakistan	1910 to 1950	12	18	19.0	13.2	11	17	20.0	12.1
Average		*10*	*17*	*22.0*	*14.0*	*10*	*17*	*23.0*	*13.0*
AVERAGE, 18 COMMODITIES		*9.2*	*17.5*	*37.2*	*21.6*	*9.1*	*16.5*	*36.6*	*22.1*

[a] Listed in descending order of total amplitude of downswing.
[b] Increase from low point as a percentage of the high point.
[c] Percentage decrease from high point.

comparatively stable export earnings, but China was more vulnerable. Cocoa proceeds fluctuated more than those from coffee or tea; among the exporters listed, Brazilian receipts were the most stable, those of Trinidad the least. For tobacco, proceeds were fairly stable, with little difference between exporters. The small difference suggests that receipts from tobacco fluctuated less in the case of the Philippines than in the case of Indonesia or Algeria. Thus, among beverages and tobacco, the main evidence of exceptional instability occurred in earnings from cocoa exports and in Chinese proceeds from tea exports. The total amplitude of cyclical downswings in receipts from linseed were exceptionally high in the case of all exporters listed in table 29. Sugar proceeds were exceptionally unstable for Mauritius and for the Philippines, but not for Indonesia or Cuba. Proceeds from wheat were unstable in the case of Argentina. Rice was not exceptionally unstable in the case of either Indonesia or Thailand. Export earnings from rubber were among the more unstable in the case of both Indonesia and Malaya, but more so in the case of the former. The main instability in this entire group occurred in Argentine wheat exports, in linseed and rubber exports and in sugar exports from Mauritius and the Philippines.

Minerals: Earnings from tin fluctuated widely in the case of Nigeria, Malaya and the Belgian Congo, but less so in the case of the other exporters listed. Copper earnings were unstable for two of the three exporters mentioned in table 29; Chilean receipts from sodium nitrate were also exceptionally unstable. Petroleum was the most dependable in the case of Iran and least dependable for Romania. Exceptional instability in the case of minerals was confined to sodium nitrate from Chile; tin from the Belgian Congo, Malaya and Nigeria; and copper from Chile and Mexico.

Long-Term Trends

Table 30 contains a summary of long-term trends[11] in foreign exchange earnings during 1901 to 1950 in respect of eighteen selected primary commodities exported by different under-developed countries. The annual rate of variation attributable to long-term factors was moderate, about 6 per cent per year, with the rate of fall slightly greater than the rate of rise. As in the case of unit value and volume, the general long-term trend of export proceeds over the period was upward, since there were more years of rising proceeds than years of falling proceeds; this influence was only to a small extent offset by the greater annual rate of fall. As in the case of year-to-year fluctuations and cyclical movements, the long-term downward trend in proceeds was greater than the corresponding figure for either unit value or quantity alone: 6.1 per cent, as against 4.3 per cent for unit value and 4.3 per cent for quantity.

The range in annual rates of long-term changes — rising phases and falling phases combined — was from 8.7 per cent for rubber and 7.8 per cent for wheat to 3.7 per cent for rice. If only falling phases are considered, the greatest average percentage of decrease per year occurred in proceeds from hemp and rubber; the smallest in earnings from rice. The only commodities to show, on balance, an unfavourable long-term trend in export proceeds — a total drop in proceeds greater than the total rise — were hemp and linseed.

Table 30. Long-Term Trends in Export Proceeds, 1901 to 1950

Commodity	Rising phase: Number of years	Rising phase: Average percentage increase per year	Falling phase: Number of years	Falling phase: Average percentage decrease per year
Hemp	9	4.5	7	8.4
Rubber	23	9.4	14	7.9
Tin	31	5.1	11	7.4
Sodium nitrate	21	4.8	13	7.3
Wheat	18	8.4	17	7.2
Sugar	26	5.8	14	6.8
Linseed	16	5.9	19	6.6
Jute	25	6.9	17	6.2
Silk	17	5.9	7	6.2
Tea	25	4.7	8	6.2
Copper	30	5.0	13	5.8
Tobacco	18	4.8	13	5.8
Wool	13	4.3	7	5.8
Petroleum	29	6.7	7	5.5
Coffee	31	4.6	12	4.9
Cocoa	22	6.1	12	4.4
Cotton	20	6.4	21	4.2
Rice	17	4.7	14	2.8
AVERAGE, 18 COMMODITIES	*22*	*5.8*	*13*	*6.1*

Fluctuations in Money and Real Terms

The total magnitude of real earnings, that is, the quantity of imports they will command, depends first on the terms of trade — relation of export prices to import prices — and secondly on the volume of exports. Terms of trade, or real import unit values for under-developed countries, in respect of specific commodities, have been previously examined for year-to-year fluctuations.[12] In this chapter variations in total real earnings are examined. The over-all averages are given in table 31, while the detailed information by individual commodities and countries is given in table 32.

It was found that the year-to-year fluctuations in total real foreign exchange earnings for the period 1901 to 1950 averaged 22.0 per cent as compared with year-to-year variations of 22.6 per cent in money earnings. Fluctuations in total real earnings were thus found to be significantly greater than year-to-year unit value variations in real terms, which averaged only 13.5 per cent. Thus, changes in volume acted as a destabilizer, both in respect of money earnings and real earnings.

Table 31. Year-to-Year Fluctuations[a] of Export Proceeds, in Money and Real Terms, by Periods

(Average percentage fluctuation per year)

Period	Proceeds: Money value	Proceeds: Real terms
Peace-time period:		
1901 to 1913	18.9	19.4
1920 to 1939	21.8	21.0
1946 to 1950	29.8	26.4
War period:		
1914 to 1919	25.6	28.3
1940 to 1945	23.7	24.6
Full period:		
1901 to 1950	22.6	22.0

[a] Averages are simple averages of the year-to-year fluctuations for eighteen commodities.

The fact that variations in money and real earnings were of about the same magnitude suggests that the degree of compensation resulting from increases in the prices of imported goods at times of rising exchange proceeds (or from declines in price at times of falling proceeds) has been almost insignificant, either because

[11] Measured by seven-year moving average.

[12] Chapter 2. For methods used in converting money prices into real prices in terms of imported manufactures, see section on "Fluctuations in Money and Real Terms" in chapter 2.

Table 32. Year-to-Year Fluctuations of Export Proceeds in Real Terms, by Commodity and Country

(Average percentage fluctuation per year)

Commodity and country[a]	Period covered	Peace-time period			War period		Full period
		1901 to 1913	1920 to 1939	1946 to 1950	1914 to 1919	1940 to 1945	
Rubber:							
Indonesia	1911 to 1950	27.7	34.2	26.2	29.8	45.8	34.0
Malaya	1906 to 1949	45.9	33.0	18.3	27.3	44.7	35.0
Average		*37.9*	*33.5*	*22.3*	*28.4*	*45.2*	*34.6*
Wheat:							
Argentina	1914 to 1950	..	35.4	34.9	47.3	20.0	32.2
Linseed:							
Argentina	1904 to 1946	16.4	11.7	..	42.7	49.0	22.7
India and Pakistan	1904 to 1950	33.3	45.9	36.2	40.8	33.7	40.1
Morocco, French	1910 to 1950	50.3	30.3	46.1	58.5	71.0	44.1
Average		*21.5*	*19.2*	*38.5*	*43.2*	*47.3*	*27.2*
Cotton:							
Brazil	1904 to 1950	38.1	48.5	38.3	43.5	23.3	41.4
China	1904 to 1944	25.7	30.3	..	18.5	50.0	31.2
Egypt	1904 to 1950	9.9	16.0	44.7	20.8	17.8	18.6
India and Pakistan	1904 to 1950	18.0	23.4	15.2	28.8	28.3	22.8
Peru	1905 to 1950	25.2	14.1	42.6	29.0	49.2	25.9
Average		*17.2*	*22.2*	*28.6*	*26.4*	*26.9*	*23.1*
Tin:							
Belgian Congo	1917 to 1950	..	14.5	16.9	..	14.5	14.0
Bolivia	1902 to 1950	14.0	21.6	7.0	16.9	14.1	16.8
Indonesia	1902 to 1950	11.5	22.3	42.4	17.5	56.0	25.5
Malaya	1902 to 1950	9.4	25.8	38.3	20.2	49.7	25.6
Nigeria	1904 to 1950	60.5	25.5	15.4	10.5	11.3	27.4
Thailand	1902 to 1950	10.9	22.6	36.9	14.0	34.8	21.9
Average		*15.0*	*23.1*	*29.2*	*17.6*	*37.1*	*22.7*
Sugar:							
Cuba	1903 to 1950	25.3	17.1	15.6	19.7	29.0	20.5
Indonesia	1902 to 1950	18.4	22.5	67.0	16.5	38.2	27.4
Mauritius	1902 to 1950	23.7	29.4	15.6	13.8	20.0	24.0
Philippines	1902 to 1950	23.4	29.0	43.3	15.2	49.0	30.0
Average		*25.2*	*24.0*	*34.7*	*18.9*	*37.8*	*26.9*
Sodium nitrate:							
Chile	1914 to 1950	..	23.3	13.3	24.4	19.0	21.4
Jute:							
India and Pakistan	1902 to 1950	14.7	16.3	19.6	37.0	27.8	20.3
Hemp:							
Philippines	1920 to 1950	..	21.1	30.7	..	11.5	21.5
Copper:							
Chile	1902 to 1950	13.8	28.3	16.4	21.0	9.3	20.5
Mexico	1902 to 1950	14.5	28.0	12.1	23.3	21.0	21.8
Peru	1902 to 1950	18.0	20.3	22.0	28.5	14.0	20.2
Average		*14.6*	*27.1*	*16.0*	*22.7*	*13.3*	*20.8*
Rice:							
Indochina	1914 to 1950	..	15.6	52.1	16.1	21.3	19.9
Thailand	1914 to 1950	..	18.9	49.1	31.4	31.6	25.0
Average		..	*17.3*	*50.6*	*23.8*	*26.5*	*22.5*
Coffee:							
Brazil	1902 to 1950	19.1	14.2	29.2	44.2	17.2	21.0
Other countries	1902 to 1950	14.0	14.4	20.8	34.5	15.0	17.6
Average		*17.4*	*14.3*	*26.4*	*41.0*	*16.5*	*19.6*

Table 32 (*continued*)

Commodity and country[a]	Period Covered	Peace-time period: 1901 to 1913	Peace-time period: 1920 to 1939	Peace-time period: 1946 to 1950	War period: 1914 to 1919	War period: 1940 to 1945	Full period
Cocoa:							
Brazil	1910 to 1950	14.7	26.9	24.6	28.6	25.8	25.8
Gold Coast	1910 to 1950	18.5	17.1	33.7	33.0	21.1	22.3
Trinidad and Tobago	1910 to 1950	13.3	20.5	58.7	29.2	39.0	28.8
Average		*17.1*	*19.8*	*33.5*	*31.6*	*23.8*	*23.7*
Petroleum:							
Mexico	1913 to 1950	37.0	16.7	20.9	14.0	8.3	16.5
Middle East	1914 to 1950	..	18.3	25.6	21.3	16.0	19.9
Iran	1914 to 1950	..	16.8	19.5	21.0	15.3	18.1
Romania	1913 to 1950	20.0	18.5	25.3	30.3	13.3	21.0
Average		*31.0*	*17.8*	*24.0*	*20.4*	*13.0*	*19.0*
Silk:							
Korea	1914 to 1939	..	14.5	..	21.5	..	11.6
Tobacco:							
Algeria	1902 to 1950	17.3	24.9	22.6	18.3	27.2	22.4
Indonesia	1902 to 1938	16.5	17.2	..	28.2	..	19.3
Philippines	1904 to 1950	14.0	14.7	18.7	19.2	..	13.7
Average		*15.8*	*17.7*	*20.0*	*23.6*	*27.2*	*18.0*
Wool:							
Argentina	1923 to 1948	..	16.3	4.0	..	6.1	15.3
Uruguay	1923 to 1948	..	15.2	15.2	..	10.4	17.7
Average		..	*16.0*	*7.0*	..	*7.2*	*15.9*
Tea:							
Ceylon	1910 to 1950	5.8	12.9	6.4	22.7	12.5	15.1
China	1910 to 1950	2.3	20.8	23.1	37.5	53.6	26.6
India and Pakistan	1910 to 1950	5.3	11.7	23.5	21.5	11.2	11.2
Average		*5.0*	*13.6*	*20.3*	*24.6*	*18.7*	*15.1*
AVERAGE, 18 COMMODITIES		*±19.4*	*±21.0*	*±26.4*	*±28.3*	*±24.6*	*±22.0*

[a] Listed in order given in table 26.

the movement of import prices was small in relation to movements of export prices of primary commodities, or else because the two movements were partly compensatory, or a combination of the two factors.

Comparison of the individual commodity and country data in tables 26 and 32 also suggests that in the great majority of individual cases studied, real purchasing power of export proceeds fluctuated less than the monetary proceeds. Thus, for the period 1901 to 1913 only nine out of thirty-six cases failed to show some lessening of fluctuations, and during the period 1920 to 1939 only thirteen out of forty-seven failed to do so.

Interrelation of Year-to-Year, Cyclical and Long-Term Fluctuations

In the preceding sections, the three types of fluctuation in total export proceeds — year-to-year, cyclical, long-term — were discussed separately. In this section the question of the relationship among these three types of instability is investigated (see table 33). How far did commodities which were relatively stable, or unstable, in one respect also tend to be stable, or unstable, in other respects, so far as fluctuations in total export proceeds were concerned?

Among the eighteen commodities analysed, the coefficients of correlation in respect of rank were all positive, indicative of a positive association in the sense that the same commodities tended to be stable, or unstable, in all three respects. The relationship between year-to-year fluctuations and total amplitude of cyclical downswing in export proceeds was the most pronounced (+0.59). The association between year-to-year fluctuations and long-term trends, as well as the relation be-

tween cyclical downswings and long-term declines was also clear, though less marked (+0.32 and 0.30, respectively).

In comparing the rates of year-to-year fluctuation with cyclical declines, it was found that of the ten commodities with average or above-average year-to-year fluctuations, eight also had above-average cyclical downswings. The eight included cotton and rubber, already shown to be unstable in all three types of price variation, and in all three types of volume fluctuation. In addition to these, export proceeds from hemp, jute, linseed, sugar, tin and wheat were also unstable, both cyclically and from year-to-year.

Of the eight commodities with year-to-year declines below the average, six were also below the average in cyclical declines, while proceeds from only two (cocoa and sodium nitrate) were unstable with regard to cyclical variations, though stable in respect of year-to-year fluctuations. Thus, fourteen of the eighteen commodities were either stable or unstable in both respects, a fact which confirms the existence of a relationship among types of fluctuation.

On comparing year-to-year declines with the rate of fall in export proceeds due to long-term factors, it was found that of the eight commodities above the average in year-to-year fluctuations, six were also unstable in respect of long-term trends. Of the eight commodities with year-to-year declines below the average, only five were also below the average in respect of long-term trends. Thus, the association here was less marked, only eleven of the eighteen commodities showing similar relative instability in both respects.

In a comparison of cyclical declines with annual declines due to long-term factors it was found that, of the ten commodities with above-average cyclical downswings, eight had above-average annual declines due to long-term factors. Of the eight commodities with below-average cyclical downswings, there were six also below the average in long-term declines. Of the eighteen commodities, fourteen were similar in both respects. However, there was only a slight relationship — from the evidence of the coefficients of correlation in respect of rank — indicating a less close relationship between cyclical and long-term, compared with yearly and long-term aspects of instability of proceeds than when compared with the year-to-year and cyclical association.

Six commodities were relatively unstable in respect of all three types of fluctuation in total export proceeds: hemp, linseed, rubber, sugar, tin and wheat. Rubber has also been shown to be unstable in all other aspects examined. Four commodities were relatively stable in respect of all three types of fluctuation: coffee, copper, petroleum and tobacco. Copper was previously shown to be relatively stable in all other aspects examined.

Table 33. Year-to-Year, Cyclical and Long-Term Fluctuations in Export Proceeds, 1901 to 1950

(Average percentage fluctuation per year)

Commodity and country	Year-to-year			Cyclical		Long-term	
	Money value	Real terms	Decreases	Upswing	Downswing	Rising phase	Falling phase
Cocoa:							
Brazil	16.4	25.8	20	27.2	20.2	5.5	3.3
Gold Coast	20.3	22.3	23	23.1	23.0	6.8	4.8
Trinidad and Tobago	25.5	28.8	25	23.9	28.3	9.9	3.4
Average	*19.8*	*23.7*	*23*	*24.0*	*23.0*	*6.6*	*4.4*
Coffee:							
Brazil	19.1	20.1	18	18.3	22.9	4.7	5.3
Other countries	22.0	17.6	16	17.7	13.5	4.8	4.4
Average	*20.6*	*19.3*	*17*	*18.0*	*20.0*	*4.6*	*4.9*
Copper:							
Chile	20.8	20.5	24	30.1	18.6	4.3	7.4
Mexico	22.7	21.8	30	28.6	21.7	6.8	5.6
Peru	19.0	20.2	21	18.3	19.0	5.7	5.4
Average	*21.3*	*20.8*	*25*	*26.0*	*20.0*	*5.0*	*5.8*
Cotton:							
Brazil	40.5	41.4	65	42.3	28.9	9.0	3.3
China	33.4	31.2	29	32.9	23.6	5.4	8.6
Egypt	19.5	18.6	20	17.6	18.7	6.8	3.7
India and Pakistan	27.6	22.8	31	26.5	25.3	5.9	4.5
Peru	26.5	25.9	23	25.3	32.2	7.7	3 8
Average	*25.9*	*23.1*	*34*	*25.0*	*24.0*	*6.4*	*4.2*
Hemp:							
Philippines	21.9	21.5	27	11.7	27.2	4.5	8.4

Table 33 (*continued*)

Commodity and country	Year-to-year			Cyclical		Long-term	
	Money value	Real terms	Decreases	Upswing	Downswing	Rising phase	Falling phase
Jute:							
India and Pakistan	22.0	20.3	25	20.3	23.7	6.9	6.2
Linseed:							
Argentina	24.4	22.7	28	20.0	21.6	4.8	4.7
India and Pakistan	35.2	40.1	42	36.1	42.8	6.9	8.0
Morocco, French	44.8	44.1	47	40.9	50.0	7.1	9.2
Average	*27.6*	*27.2*	*39*	*24.0*	*27.0*	*5.9*	*6.6*
Petroleum:							
Mexico	16.6	16.5	19	13.1	11.6	7.2	6.9
Middle East	21.0	19.9	11	16.3	8.9	6.3	3.3
Iran	19.0	18.1	10	15.9	8.1	6.7	3.7
Romania	18.1	21.0	17	19.2	17.7	6.2	4.3
Average	*19.2*	*19.0*	*14*	*16.0*	*11.0*	*6.7*	*5.5*
Rice:							
Indochina	20.8	19.9	29	13.2	14.6	5.0	3.5
Thailand	21.3	25.0	22	22.5	19.3	4.4	2.1
Average	*21.1*	*22.5*	*26*	*18.0*	*17.0*	*4.7*	*2.8*
Rubber:							
Indonesia	35.3	34.0	29	28.8	28.1	9.6	7.3
Malaya	36.5	35.0	34	24.4	28.0	9.1	7.9
Average	*35.9*	*34.6*	*32*	*26.0*	*28.0*	*9.4*	*7.6*
Silk:							
Korea	19.2	11.6	21	23.6	19.3	5.9	6.2
Sodium nitrate:							
Chile	22.2	21.4	24	26.3	32.4	4.8	7.3
Sugar:							
Cuba	21.3	20.5	25	22.6	24.1	5.3	6.1
Indonesia	24.2	27.4	25	17.8	15.5	5.4	6.6
Mauritius	24.1	24.0	28	24.5	24.4	5.9	6.0
Philippines	30.8	30.0	29	21.7	29.0	7.5	8.4
Average	*22.7*	*26.9*	*26*	*21.0*	*23.0*	*5.8*	*6.8*
Tea:							
Ceylon	12.1	15.1	12	9.3	9.9	4.5	5.3
China	12.7	26.6	32	24.2	19.1	12.3	9.0
India and Pakistan	13.4	11.2	13	13.2	12.1	4.2	5.8
Average	*14.9*	*15.1*	*19*	*14.0*	*13.0*	*4.7*	*6.2*
Tin:							
Belgian Congo	30.9	14.0	33	21.1	30.2	6.8	9.9
Bolivia	18.4	16.8	19	14.0	16.2	3.8	8.4
Indonesia	25.9	25.5	30	21.2	25.2	5.3	8.1
Malaya	26.5	25.6	31	21.3	26.0	4.0	7.2
Nigeria	28.1	27.4	31	23.4	33.9	4.5	7.1
Thailand	22.5	21.9	20	17.2	17.0	6.0	5.9
Average	*24.8*	*22.7*	*27*	*20.0*	*24.0*	*5.1*	*7.4*
Tobacco:							
Algeria	22.9	22.4	21	29.5	20.7	4.8	6.6
Indonesia	16.4	19.3	17	17.9	19.1	4.6	6.3
Philippines	17.8	13.7	15	12.2	14.9	4.7	4.5
Average	*18.0*	*18.0*	*18*	*18.0*	*18.0*	*4.8*	*5.8*
Wheat:							
Argentina	33.1	32.2	32	42.0	33.1	8.4	7.2
Wool:							
Argentina	14.5	15.3	12	16.0	14.6	4.1	5.3
Uruguay	16.8	17.7	14	14.9	14.1	4.7	7.2
Average	*15.1*	*15.9*	*13*	*15.7*	*14.5*	*4.3*	*5.8*
AVERAGE, 18 COMMODITIES	*±22.6*	*±22.0*	*−25*	*+21.6*	*−22.1*	*+5.8*	*−6.1*

Chapter 5

INTERRELATION OF FLUCTUATIONS IN PRICE, VOLUME AND PROCEEDS

In the preceding chapters, the various types of fluctuation in price, volume and proceeds of primary commodities exported by under-developed countries were considered separately. The present chapter deals with the relations among them; the first part discusses the relative magnitude of the fluctuations in price, volume and proceeds, and the second part, the relative contribution of changes in price and volume to fluctuations in proceeds. Variations in proceeds are, of course, a product of fluctuations in price and in volume.

Relative Magnitude of Fluctuations

Year-to-year fluctuations

Year-to-year fluctuations in price, volume and proceeds are shown in the figures below, which give average percentage fluctuations per year. Fluctuations in receipts were greater than fluctuations in both volume and price; this was true in all the periods examined. In some periods fluctuations in receipts were twice as high as fluctuations in price.

	Peace-time period[a]			*War period*[a]		*Full period*
	1901 to 1913	*1920 to 1939*	*1946 to 1950*[a]	*1914 to 1919*	*1940 to 1945*	
Price	10.9	15.0	17.8	15.6	11.6	13.7
Volume	19.6	16.1	24.6	22.2	22.8	18.7
Proceeds	22.7	21.8	29.8	25.6	23.7	22.6

[a] For actual periods covered, see tables 6, 22 and 26.

In examining the relation of year-to-year movements in price, volume and proceeds in the case of individual commodities, it was found that the ranking with respect to year-to-year fluctuations in price was linked to that of volume by a coefficient of +0.31, indicating a slight tendency for commodities to be stable or unstable in both respects. Year-to-year fluctuations in price and in receipts had a higher coefficient of correlation (+0.66), indicating that, on the whole, the rank of specified commodities with respect to the degree of fluctuation in export proceeds and in price was similar. Year-to-year changes in export volume and receipts had a still higher coefficient (+0.77), indicating that the sensitiveness of given commodities to changes in receipts was more closely linked to fluctuations in volume than price. To sum up, all three types of year-to-year fluctuations — in price, in volume and in receipts — tended to be statistically correlated.

The relation among year-to-year fluctuations may also be indicated by the following analysis. Of the eighteen commodities listed, eight were simultaneously stable, or unstable, with respect to price and volume changes; twelve were stable, or unstable, with regard to fluctuations in prices and proceeds; and fourteen were stable, or unstable, in respect of volume and proceeds. In the case of each measurement — price, volume or proceeds — a significant number displayed similar behaviour. Thus, there was a tendency for commodities which were especially vulnerable to fluctuations in one respect to be unstable in other respects as well.

The close relationship among fluctuations in price, volume and proceeds is further apparent from the fact that there were, among eighteen commodities, eight which were relatively unstable or relatively stable in all three respects. Cotton, linseed, rubber and wheat were particularly sensitive to year-to-year fluctuations in price, volume and proceeds; and copper, petroleum, tea and tobacco were below the average in all three respects.

Table 34 shows the comparative position of various commodities and exporting countries in respect of the year-to-year rise or fall in price, volume and proceeds. Although fluctuations in volume were greater than variations in price from year to year, in the case of the general average, and for most of the commodities, there were several notable exceptions. Fluctuations in prices of coffee and some fibres — hemp, silk and wool — were greater than variations in volume. In the case of cocoa, price and quantity fluctuations were of equal magnitude. Notable differences among exporting countries are also shown in table 34.

There were greater fluctuations in receipts than in prices in virtually all of the large number of commodity subvarieties which were analysed in respect of their sales in the United States market. Table I in appendix D compares average year-to-year fluctuations in price and in proceeds with respect to these items. Of the 218 items analysed, all but three had had greater fluctuations in proceeds than in unit values during the period ending in 1949. Similarly, of the 175 items for which the ratio of variations in proceeds to those in unit values was computed for the period ending in 1939, there were

Table 34. Year-to-Year Fluctuations in Price, Volume and Proceeds, 1901 to 1950

(Average percentage fluctuation per year)

Commodity, country and period	Price[a]	Volume	Proceeds
Cocoa:			
Brazil, 1910 to 1950		16.0	16.4
Gold Coast, 1910 to 1950		16.2	20.3
Trinidad and Tobago, 1910 to 1950		22.8	25.5
Average	*16.7*	*16.7*	*19.8*
Coffee:			
Brazil, 1902 to 1950		16.4	19.1
Other countries, 1902 to 1950		8.3	22.0
Average	*14.3*	*12.4*	*20.6*
Copper:			
Chile, 1902 to 1950		16.1	20.8
Mexico, 1902 to 1950		18.5	22.7
Peru, 1902 to 1950		11.9	19.0
Average	*12.5*	*16.3*	*21.3*
Cotton:			
Brazil, 1904 to 1950		46.0	40.5
China, 1904 to 1944		28.9	33.4
Egypt, 1904 to 1950		14.2	19.5
India and Pakistan, 1904 to 1950		22.5	27.6
Peru, 1905 to 1950		21.0	26.5
Average	*18.4*	*21.3*	*25.9*
Hemp:			
Philippines, 1920 to 1950	19.1	16.5	21.9
Jute:			
India and Pakistan, 1902 to 1950	16.1	16.8	22.0
Linseed:			
Argentina, 1904 to 1946		29.0	24.4
India and Pakistan, 1904 to 1950		36.3	35.2
Morocco, French, 1910 to 1950		41.8	44.8
Average	*18.2*	*31.1*	*27.6*
Petroleum:			
Mexico, 1913 to 1950		21.6	16.6
Middle East, 1914 to 1950		16.5	21.0
Iran, 1914 to 1950		14.2	19.0
Romania, 1913 to 1950		15.6	19.1
Average	*9.7*	*18.1*	*19.2*
Rice:			
Indochina, 1914 to 1950		15.4	20.8
Thailand, 1914 to 1950		23.2	21.3
Average	*11.6*	*19.5*	*21.1*
Rubber:			
Indonesia, 1911 to 1950		28.6	35.3
Malaya, 1906 to 1949		29.4	36.5
Average	*20.7*	*29.0*	*35.9*
Silk:			
Korea, 1914 to 1939	14.4	13.4	19.2
Sodium nitrate:			
Chile, 1914 to 1950	4.9	22.3	22.2
Sugar:			
Cuba, 1903 to 1950		17.0	21.3
Indonesia, 1902 to 1950		17.2	24.2
Mauritius, 1902 to 1950		17.9	24.1
Philippines, 1902 to 1950		23.4	30.8
Average	*15.3*	*18.3*	*24.1*
Tea:			
Ceylon, 1910 to 1950		5.6	12.1
China, 1910 to 1950		21.5	24.7
India and Pakistan, 1910 to 1950		9.7	13.4
Average	*8.8*	*10.3*	*14.9*
Tin:			
Belgian Congo, 1917 to 1950		25.9	30.9
Bolivia, 1902 to 1950		11.1	18.4
Indonesia, 1902 to 1950		19.6	25.9
Malaya, 1902 to 1950		18.0	26.5
Nigeria, 1904 to 1950		21.2	28.1
Thailand, 1902 to 1950		15.7	22.5
Average	*13.9*	*17.5*	*24.8*
Tobacco:			
Algeria, 1902 to 1950		22.6	22.9
Indonesia, 1902 to 1938		15.7	16.4
Philippines, 1904 to 1950		12.4	17.8
Average	*10.1*	*15.8*	*18.0*
Wheat:			
Argentina, 1914 to 1950	*15.7*	*33.3*	*33.1*
Wool:			
Argentina, 1923 to 1948		4.8	14.5
Uruguay, 1923 to 1948		9.6	16.8
Average	*14.7*	*6.0*	*15.1*
AVERAGE, 18 COMMODITIES	*±13.7*	*±18.7*	*±22.6*

Source: See appendix A.
[a] Prices represent United States import unit values.

only six cases in which proceeds fluctuated less than prices. In 60 per cent of the 218 items, and in 51 per cent of the 175 items, variations in proceeds were at least twice as great as fluctuations in unit values.

The relation among changes in price, volume and proceeds with respect to exports from various underdeveloped regions as a whole to the United States from 1923 to 1939 is indicated below (in average percentage fluctuations per year.)[1] Year-to-year fluctuations in proceeds were greater in all instances than those in prices or volume considered separately. Year-to-year

[1] Derived from data contained in study by J. H. Adler, E. R. Schlesinger and E. van Westerborg, "Indexes of United States Imports by Geographical Areas and Commodity Classification, 1923-1949". See footnote 8, chapter 2.

movements of prices and volume in the case of the oversea sterling area were compensatory to a lesser extent than in the other instances.

	Latin America	*Oversea sterling area*	*Rest of world*	*All countries*
Price	8.8	18.8	9.8	8.3
Volume	10.1	14.5	10.2	10.7
Proceeds	14.3	29.0	15.6	15.8

Cyclical movements

A comparative statement of the annual rate of cyclical swings in price, volume and proceeds is given in table 35. The figures for cyclical declines indicate an annual rate of 13.0 per cent for prices, 16.8 per cent for quantities and 22.1 per cent for proceeds. Figures for upswings were very close to those for downswings. Fluctuations in proceeds were greater than those in either price or volume alone. There were, however, a few exceptions to the general rule that cyclical downswings in proceeds were greater than cyclical downswings in price or volume considered separately. In the case of one commodity, silk, cyclical downswings in proceeds were smaller than in prices. There were three commodities — linseed, petroleum and wheat — in which receipts fluctuated less than volume.

Table 35. Cyclical Movements in Price, Volume and Proceeds, 1901 to 1950

(Average percentage fluctuation per year)

Commodity and country	*Period covered*	*Upswing*			*Downswing*		
		Price[a]	*Volume*	*Proceeds*	*Price[a]*	*Volume*	*Proceeds*
Cocoa:							
Brazil	1910 to 1950		18.7	27.2		15.8	20.2
Gold Coast	1910 to 1950		18.4	23.1		18.8	23.0
Trinidad and Tobago	1910 to 1950		24.8	23.9		24.3	28.3
Average		*15.7*	*19.0*	*24.0*	*17.5*	*19.0*	*23.0*
Coffee:							
Brazil	1902 to 1950		16.7	18.3		14.5	22.9
Other countries	1902 to 1950		10.3	17.7		9.0	13.5
Average		*18.2*	*15.0*	*18.0*	*12.9*	*12.0*	*20.0*
Copper:							
Chile	1902 to 1950		16.4	30.1		21.0	18.6
Mexico	1902 to 1950		23.0	28.6		6.2	21.7
Peru	1902 to 1950		10.6	18.3		14.3	19.0
Average		*14.3*	*18.0*	*26.0*	*11.2*	*12.0*	*20.0*
Cotton:							
Brazil	1904 to 1950		46.8	42.3		41.3	28.9
China	1904 to 1944		25.2	32.9		26.9	23.6
Egypt	1904 to 1950		13.1	17.6		16.7	18.7
India and Pakistan	1904 to 1950		18.2	26.5		18.7	25.3
Peru	1905 to 1950		22.2	25.3		26.3	32.2
Average		*16.3*	*19.0*	*25.0*	*18.6*	*20.0*	*24.0*
Hemp:							
Philippines	1920 to 1950	15.0	12.0	11.7	16.4	10.8	27.2
Jute:							
India and Pakistan	1902 to 1950	14.4	15.3	20.3	20.2	16.2	23.7
Linseed:							
Argentina	1904 to 1946		24.6	20.0		23.9	21.6
India and Pakistan	1904 to 1950		34.8	36.1		40.7	42.8
Morocco, French	1910 to 1950		41.2	40.9		36.6	50.0
Average		*18.7*	*27.0*	*24.0*	*15.0*	*28.0*	*27.0*
Petroleum:							
Mexico	1913 to 1950		10.9	13.1		14.6	11.6
Middle East	1914 to 1950		9.4	16.3		10.5	8.9
Iran	1914 to 1950		10.1	15.9		6.9	8.1
Romania	1913 to 1950		13.3	19.2		9.0	17.7
Average		*9.2*	*11.0*	*16.0*	*8.7*	*12.0*	*11.0*

Table 35 (*continued*)

Commodity and country	Period covered	Upswing: Price[a]	Upswing: Volume	Upswing: Proceeds	Downswing: Price[a]	Downswing: Volume	Downswing: Proceeds
Rice:							
Indochina	1914 to 1950		16.8	13.2		16.9	14.6
Thailand	1914 to 1950		29.9	22.5		15.9	19.3
Average		*13.0*	*23.0*	*18.0*	*16.0*	*16.4*	*17.0*
Rubber:							
Indonesia	1911 to 1950		26.6	28.8		22.6	28.1
Malaya	1906 to 1949		23.1	24.4		19.2	28.0
Average		*17.6*	*25.0*	*26.0*	*14.5*	*21.0*	*28.0*
Silk:							
Korea	1914 to 1939	12.0	9.4	23.6	21.1	5.9	19.3
Sodium nitrate:							
Chile	1914 to 1950	6.4	23.5	26.3	8.6	25.0	32.4
Sugar:							
Cuba	1903 to 1950		18.7	22.6		19.2	24.1
Indonesia	1902 to 1950		9.6	17.8		10.9	15.5
Mauritius	1902 to 1950		13.6	24.5		23.8	24.4
Philippines	1902 to 1950		15.6	22.7		21.9	29.0
Average		*12.2*	*15.0*	*21.0*	*13.6*	*17.0*	*23.0*
Tea:							
Ceylon	1910 to 1950		7.0	9.3		6.0	9.9
China	1910 to 1950		27.4	24.2		21.3	19.1
India and Pakistan	1910 to 1950		9.2	13.2		9.2	12.1
Average		*8.0*	*12.0*	*14.0*	*10.5*	*10.0*	*13.0*
Tin:							
Belgian Congo	1917 to 1950		15.2	21.1		22.6	30.2
Bolivia	1902 to 1950		10.9	14.5		8.3	16.2
Indonesia	1902 to 1950		19.4	24.2		18.3	25.2
Malaya	1902 to 1950		17.7	21.3		20.1	26.0
Nigeria	1904 to 1950		13.2	23.4		23.4	33.9
Thailand	1902 to 1950		9.9	17.2		9.9	17.0
Average		*10.9*	*16.0*	*20.0*	*14.0*	*17.0*	*24.0*
Tobacco:							
Algeria	1902 to 1950		24.4	29.5		25.4	20.7
Indonesia	1902 to 1938		20.6	17.9		18.7	19.1
Philippines	1904 to 1950		13.0	12.2		10.4	14.9
Average		*10.3*	*19.0*	*18.0*	*9.9*	*17.0*	*18.0*
Wheat:							
Argentina	1914 to 1950	14.9	31.8	42.0	11.3	39.2	33.1
Wool:							
Argentina	1923 to 1948		4.0	16.0		2.6	14.6
Uruguay	1923 to 1948		8.4	14.9		10.8	14.1
Average		*13.7*	*5.0*	*15.7*	*12.7*	*4.7*	*14.5*
AVERAGE, 18 COMMODITIES		*12.7*	*17.6*	*21.7*	*13.0*	*16.8*	*22.1*

[a] Prices represent United States import unit values.

Examination of the degree of cyclical instability in respect of price, volume and proceeds in order to determine whether the same commodities tended to be stable, or unstable, in these respects, showed no such relation — either positive or negative — between the total amplitude of cyclical downswings in price and in volume. The coefficient of correlation in rank among the eighteen commodities was negligible (+0.01). A small positive correlation was found between the total amplitude of cyclical movements in prices and in proceeds (+0.17). Thus, there was a slight tendency for commodities to be stable, or unstable, in cyclical down-

swings in both prices and proceeds. On the other hand, a high correlation occurred between the amplitude of cyclical downswings in volume and in receipts (+0.84). Thus, there was some tendency for the three measures of instability to be related, though in varied degree, and the vulnerability of different commodities to cyclical declines in export proceeds seemed to be linked in large part to instability in volume rather than in price.

Six of the eighteen commodities had greater than average cyclical downswings in price, volume and proceeds: rubber, linseed, cotton, tin, cocoa and sugar. The first two were among the least stable. Five commodities were relatively stable in all three respects: coffee, copper, wool, tea and petroleum. These were previously shown to be relatively stable in other particulars. Thus, cyclical downswings in eleven of the eighteen commodities were either relatively large or relatively small in all three respects.

The remaining seven commodities, which tended to show disparate behaviour in cyclical downswings, fell into two groups. Jute, silk, rice and hemp showed a high degree of vulnerability to cyclical price changes, but variations in volume were below average, particularly in the case of silk and hemp. The extent of the cyclical movement in proceeds was above average for jute and hemp but below average for silk and rice. The second group, represented by tobacco, sodium nitrate and wheat, showed relative stability in price, but instability in volume. This divergence resulted in relatively stable proceeds for tobacco and relatively unstable proceeds for sodium nitrate and wheat.

Long-term trends

The interrelation among fluctuations in price, volume and proceeds in respect of long-term changes due to secular factors, is shown in table 36. Long-term trends in price and volume — particularly declines — were less closely related than either year-to-year fluctuations in price and volume or cyclical movements. While there was a general tendency for export volume to rise or fall with prices, the tendency was not very marked.

In the case of twelve of the seventeen[2] commodities for which long-term declines were analysed, the drop in proceeds was greater than declines in price or volume alone, but in the remaining five commodities — coffee, cotton, jute, linseed and rice — the long-term drop in proceeds was less than in price or volume alone.

The coefficient of correlation in rank between long-term trends in price and in quantity during falling phases was very slight (+0.09), indicating that there was no definite tendency for commodities which had high annual rates of price decline due to long-term factors to have long-term declines in volume as well. The relation of the long-term trend in proceeds and volume (+0.50) was about equal to that between prices and proceeds (+0.48).

[2] Silk is excluded since there was no long-term decline in the quantity exported from Korea.

Table 36. Long-Term Trends in Price, Volume and Proceeds, 1901 to 1950

(Average percentage fluctuation per year)

Commodity	Rising phase			Falling phase		
	Price	Volume	Proceeds	Price	Volume	Proceeds
Cocoa	4.5	3.5	6.6	3.8	2.2	4.4
Coffee	4.8	2.3	4.6	5.5	2.2	4.9
Copper	4.6	4.1	5.0	4.0	3.5	5.8
Cotton	5.4	4.8	6.4	4.9	4.2	4.2
Hemp	6.2	2.0	4.5	2.8	2.3	8.4
Jute	4.4	4.6	6.9	6.6	4.8	6.2
Linseed	6.3	6.2	5.9	4.3	7.1	6.6
Petroleum	5.7	4.1	6.7	4.3	5.1	5.5
Rice	2.8	4.1	4.7	4.3	4.8	2.8
Rubber	4.9	5.2	9.4	7.1	6.6	7.9
Silk	5.6	2.8	5.9	6.4	—	6.2
Sodium nitrate	4.1	5.3	4.8	3.0	5.7	7.3
Sugar	4.3	3.9	5.8	6.0	4.8	6.8
Tea	3.0	2.9	4.7	4.6	3.9	6.2
Tin	3.3	4.8	5.1	4.0	4.3	7.4
Tobacco	5.5	4.5	4.8	4.0	3.8	5.8
Wheat	4.3	5.6	8.4	4.2	5.7	7.2
Wool	3.5	2.0	4.3	4.7	2.7	5.8
AVERAGE, 18 COMMODITIES	*4.7*	*4.0*	*5.8*	*4.3*	*4.3*	*6.1*

In the case of jute, rubber and sugar, rates of decline were above the average in respect of price, volume and proceeds. In respect of cocoa, copper and tobacco, they were below average in all three respects.

Summary of correlations in rank

In table 37, the correlation coefficients of the rank of the eighteen commodities in respect of various types of fluctuation are brought together for ready comparison. A high coefficient of correlation (+0.50 or more) indicates a tendency for a commodity to be stable, or unstable, with respect to both types of fluctuation measured. A negative figure would indicate the opposite, but no instance of marked negative correlation was found. The fact that all the figures were positive indicates a general relationship among different kinds of instability.

Table 37. Correlation between Types of Fluctuation in Price, Volume and Proceeds, 1901 to 1950

(Coefficient of correlation in rank of eighteen commodities)

Type of fluctuation	Year-to-year			Cyclical			Long-term			Within-year fluctuations in price
	Price	Volume	Proceeds	Price	Volume	Proceeds	Price	Volume	Proceeds	
Year-to-year:										
Price		0.31	0.66	0.81	...	...	0.28	...	...	0.19
Volume	0.31		0.77	...	0.86	...	...	0.83	...	...
Proceeds	0.66	0.77		...	...	0.59	...	...	0.32	...
Cyclical:										
Price	0.81	...	...		0.01	0.17	0.10	...	...	0.44
Volume	...	0.86	...	0.01		0.84	...	0.62	...	...
Proceeds	...	...	0.59	0.17	0.84		...	...	0.30	...
Long-term:										
Price	0.28	...	...	0.10	...	...		0.09	0.48	...
Volume	...	0.83	...	...	0.62	...	0.09		0.50	...
Proceeds	...	...	0.32	...	...	0.30	0.48	0.50		...
Within-year:										
Price	0.19	...	...	0.44	...	...	...	...	...	...

Relative Contribution of Changes in Price and Volume to Fluctuations in Proceeds

Fluctuations in price were no doubt an important factor, but by no means the major element, in producing fluctuations in total proceeds. Even with stable prices, significant fluctuations in export proceeds would have occurred if other factors had remained the same. On the whole, fluctuations in volume tended to intensify the effect of price changes. Price stabilization without stabilization in volume would have reduced fluctuations in proceeds by only one-sixth.

Year-to-year fluctuations

Although variations in receipts generally exceeded variations in volume, the amount of the difference was generally not substantial. Thus, changes in volume alone accounted for a major part of the fluctuation in proceeds during the period as a whole. While fluctuations in volume were considerable, their direction was opposite to that of price movements often enough to lessen the combined effect on proceeds.[3]

There were marked divergencies among commodities in the relative importance of price and volume fluctuations. Stabilization of volume, alone, without stabilization of prices, would have reduced total year-to-year fluctuations in proceeds by more than 40 per cent only in the case of eight of the eighteen commodities: copper, petroleum, sodium nitrate, rice, rubber, tin, tobacco and wheat; and only in the case of sodium nitrate would volume stabilization alone have been sufficient to counteract the major part of the instability in proceeds. Similarly, price stabilization without volume stabilization would have reduced year-to-year fluctuations in proceeds by more than 40 per cent only in the case of wool. In the case of linseed, fluctuations in volume alone were greater than fluctuations in proceeds.

[3] Fluctuations in proceeds for the average commodity may be described by the formula X + ½ Y, where X represents price fluctuations and Y, fluctuations in volume. In other words, half of the gross fluctuations in volume increased the effect of price fluctuations in producing instability in proceeds; or, in about three-quarters of the cases, price and volume fluctuations reinforced each other, since the position was intermediate between no correlation at all (indicating that 50 per cent of all movements were compensatory) and full correlation (indicating that no movements were compensatory). A similar relation also occurred in respect of cyclical fluctuations.

The examination of the interrelation among prices, quantities and proceeds contained earlier in this chapter indicated the cumulative nature of the relationship, that is, proceeds tended to fluctuate more than prices or volume alone, and there were often close correlations in rank. In other words, commodities which tended to be stable, or unstable, in one respect also tended to be stable, or unstable, in other respects.

An attempt was made to determine more exactly the relationship between year-to-year fluctuations in price and corresponding fluctuations in volume, since a cumulative relationship between fluctuations in prices and in proceeds might arise in one of two ways: either by a movement of prices and quantities in the same direction, or by a movement in opposite directions — with the movement in volume sufficiently greater than the price movement to result in instability rather than stability in proceeds. It is obvious that if prices rose 5 per cent and volume declined 15 per cent, proceeds would be less stable than prices as a result of overcompensation. As already noted, year-to-year fluctuations in volume tended to be greater than year-to-year price fluctuations, particularly when commodities were subdivided into specific grades and varieties. Fluctuations in proceeds were therefore governed to a greater extent by fluctuations in volume than by fluctuations in price.

Analysis of eighteen commodities

Coefficients of correlation between year-to-year price and volume fluctuations in eighteen commodities, shown below, gave inconclusive results. Of the correlations obtained, only five were high enough to indicate a significant connexion. Of the five, three showed a positive correlation, indicating that volume tended to increase or decrease from year to year together with prices; this was found to be the case for copper, hemp and tin. On the other hand, in the case of two commodities — linseed and rice — the relationship was reversed; price and volume fluctuations moved in opposite directions. The majority of the commodities analysed were between these two groups, with coefficients of correlation that did not indicate a significant relationship in either direction. The coefficients of correlation between year-to-year changes in price and in volume were as follows:

Hemp	+0.598	Wheat	−0.041
Copper	+0.481	Silk	−0.063
Tin	+0.254	Sodium nitrate.	−0.096
Petroleum	+0.110	Tobacco	−0.0978
Wool	+0.089	Coffee	−0.146
Jute	+0.0065	Tea	−0.151
Cotton	−0.00143	Cocoa	−0.196
Rubber	−0.00288	Rice	−0.308
Sugar	−0.0349	Linseed	−0.4204

While the correlation between changes in the direction of volume and price fluctuations was inconclusive in general, there was a significant difference between industrial raw materials and foodstuffs in this respect. For industrial materials alone, there was a tendency for the correlation to be positive, though not always high. This indicated that price and volume tended to move up or down together; the conclusion may be drawn that they both tended to be governed by changes in demand. In the case of foodstuffs, the correlation tended to be negative, that is, price and volume tended to move in opposite directions — indicating that increases in supply, caused by plentiful crops, for example, tend to drive prices down, or vice versa. In such cases, changes in the supply factor governed fluctuations in prices and proceeds. The distinction between industrial raw materials and foodstuffs was marked; when the eighteen commodities analysed were listed in descending order of agreement in the direction of changes in price and in volume, the first eight commodities were all industrial materials; the last five commodities were all foodstuffs; there was some overlapping only in the middle group of five.

There was no clear correlation in the direction of changes in price and in volume in spite of a pronounced tendency for proceeds to be less stable than prices. These two findings, particularly in relation to food items, may be reconciled by the fact that proceeds may become unstable in relation to prices not only by changes in volume in the same direction as in price but also by a movement of volume in the opposite direction to price changes, provided that this opposite movement is at least twice as great as the price change.

When variations in price and volume during each year of the periods covered in the study — a total of 638 observations[4] — were examined, fluctuations in volume were generally found to be greater than in price — sometimes twice as great — with sufficient frequency to produce fluctuations in proceeds in excess of price variations, even in the absence of a clear tendency for price and volume to move in the same direction. Price and volume moved in the same direction in only 296 of the 638 observations; in 342 cases, the movements were in opposite directions, indicating the absence of a clear-cut positive relationship.[5]

There was a marked difference in this respect between food and non-food items. In the case of non-food items, there was a slight preponderance of changes in the same direction in price and volume; the food items showed a marked tendency for the direction of changes in volume to be opposite to changes in price, confirming the previous conclusion that the supply side is more important in causing price changes in the case of foodstuffs and the demand factor, in the case of raw materials.

Among the 638 observations, there were no less than 107 in which fluctuations in volume, though in the op-

[4] Excluding forty-two instances in which either price or volume remained unchanged.

[5] For each commodity, the principal exporting country was selected for this analysis.

posite direction to those in price, were more than twice as great, and thus served to destabilize proceeds. If these 107 cases are added to the 296 instances in which price and volume moved in the same direction, then in 403 of the 638 cases, or almost two-thirds, the variations in volume had a destabilizing effect, either because they moved in the same direction as prices, or because they moved sufficiently far in the opposite direction. In the case of food items, the marked tendency of price and volume to move in opposite directions (161 instances out of 276) was combined with an equally marked tendency for proceeds to be destabilized by movements in volume (166 instances out of 276), even though the movements in volume and price sometimes tended to be in opposite directions. In the case of raw materials, there was no clear tendency for prices to move in the same direction as volume (181 instances out of 362) and yet there was a marked tendency for changes in volume in relation to prices to destabilize proceeds (237 out of 362 instances).

Thus the coexistence of a cumulative relationship among changes in price, volume and proceeds, and the absence of a clear correlation between the direction of changes in price and in volume, are explained by the greater volatility of fluctuations in volume.

Analysis of subvarieties

Analysis of a sample — consisting of 218 items of sales of specific grades and varieties — of primary commodities in the United States market indicates that volume was of greater importance than price in determining fluctuations in proceeds. Price fluctuations contributed less than 50 per cent to fluctuations in proceeds in 100 cases of the 175 items studied in the period ending in 1939 and in 130 of the 218 items in the period ending in 1949, as table 38 indicates.

Table 38. Frequency Distribution of Ratios between Year-to-Year Fluctuations in Proceeds and in Import Unit Values

Ratio	Per cent of price contribution to total fluctuation	Frequency of items: Period ending in 1939	Frequency of items: Period ending in 1949
0 to 0.9	Over 100	6	2
1.0 to 1.9	51 to 100	69	86
2.0 to 2.9	34 to 50	57	73
3.0 to 3.9	26 to 33	26	36
Over 4.0	25 and under	17	21
TOTAL NUMBER OF ITEMS		175	218

Source: See table I in appendix D.

The ratio of unweighted average variations in proceeds to unweighted average fluctuations in unit value was 2.2 for each of the two periods covered; the ratio between the two weighted averages for the full period ending in 1949 was lower — 1.8. It thus appears that unit value fluctuations accounted for about half of the total fluctuations in proceeds; in other words, if quantities had remained constant, fluctuations would have been one-half as great as those actually experienced. The median values were a ratio of 2.2 for fluctuations during the period ending in 1939 and 2.3 for fluctuations in the period ending in 1949, indicating that price fluctuations contributed 45.5 per cent and 43.5 per cent, respectively, of the total changes in proceeds. The figures are fairly close to those obtained for selected primary commodities in respect of all sales; in that case, fluctuations in proceeds averaged 22.6 per cent and price fluctuations 13.7 per cent, a ratio of 1.6. The larger ratio in the case of specific subvarieties suggests that the relative importance of volume, compared with price, was even greater than in the case of the broad categories of commodities. The substantially unchanged median values of the ratios when the period ending in 1949 is analysed indicate that the contribution of price instability to fluctuations in proceeds remained almost constant during the last decade of the period under review. There were very few subvarieties of commodities for which changes in volume, on balance, counteracted fluctuations due to price changes, and for which proceeds fluctuated less than unit values.

Regional differences

That fluctuations in price and in volume reinforced each other is further illustrated by the following figures pertaining to the exports of certain under-developed regions to the United States between 1923 and 1939:

	Average year-to-year fluctuations: Prices	Average year-to-year fluctuations: Proceeds
Exports to United States from:		
Latin America	9.2	15.3
Oversea sterling area	20.6	33.0
Other under-developed countries	10.3	16.8

The variation in proceeds was consistently higher than the change in prices alone. The ratios of fluctuations in proceeds to fluctuations in price were close to 1.5 throughout; price fluctuations, therefore, accounted for about two-thirds of the total fluctuation in proceeds and volume fluctuations consistently reinforced price fluctuations, resulting in fluctuations in proceeds.

Contribution of price declines to falling proceeds

Analysis of the falling phases of year-to-year fluctuations in export proceeds, to determine the relative contribution of price and of volume to the decline, confirmed the results previously obtained. In table 39, the eighteen commodities are arranged in descending order of the average contribution of price decreases in the commodity to declines in export proceeds (column 4). Thus, the commodities listed first are those in which prices played the greater part in producing declines in proceeds — and volume, the smaller part. All declines in proceeds were associated with falling prices.

Table 39. Contribution of Year-to-Year Price Declines to Falling Export Proceeds

(Average percentage fluctuation per year)

Commodity and country	Years of falling proceeds (number) (1)	Decrease in proceeds (percentage) (2)	Decrease in prices (percentage) (3)	Column (3) as percentage of column (2) (4)
Silk:				
Korea	7	21	25	119
Wool:				
Argentina .	12	12	13	108
Uruguay ...	10	14	12	86
Hemp:				
Philippines.	10	27	21	78
Coffee:				
Brazil	22	18	7	39
Other countries	21	16	12	75
Petroleum:				
Mexico	11	19	6	32
Middle East	9	11	9	82
Iran	10	10	8	80
Romania ..	16	17	5	29
Tin:				
Belgian Congo ...	10	33	14	42
Bolivia	17	19	12	63
Indonesia ..	17	30	13	43
Malaya ...	17	31	13	42
Nigeria	13	31	16	52
Thailand ..	22	20	8	40
Copper:				
Chile	15	24	13	54
Mexico	17	30	11	37
Peru	17	21	10	48
Rubber:				
Indonesia ..	19	29	12	41
Malaya	16	34	17	50
Sugar:				
Cuba	15	25	14	56
Indonesia ..	21	25	11	44
Mauritius ..	19	28	14	50
Philippines.	18	29	10	34
Tea:				
Ceylon	14	12	8	67
China	17	32	4	13
India and Pakistan .	14	13	5	38
Cocoa:				
Brazil	17	20	8	40
Gold Coast .	13	23	12	52
Trinidad and Tobago ..	20	25	8	32
Jute:				
India and Pakistan .	16	25	9	36
Tobacco:				
Algeria	23	21	4	19
Indonesia ..	16	17	6	35
Philippines.	16	15	7	47
Cotton:				
Brazil	22	65	2	3
China	24	29	6	21
Egypt	21	20	13	65
India and Pakistan .	21	31	9	29
Peru	22	23	8	35
Rice:				
Indochina ..	6	29	12	41
Thailand ..	18	22	4	18
Linseed:				
Argentina .	23	28	4	14
India and Pakistan .	22	42	8	19
Morocco, French ..	15	47	7	15
Sodium nitrate:				
Chile	15	24	3	13
Wheat:				
Argentina .	19	32	1	3
AVERAGE, 18 COMMODITIES		*25*	*10*	*40*

Falling prices were an important element in declining proceeds, but not the major determinant. Proceeds fell, on an average, about 25 per cent[6] in years of falling proceeds (varying from seven years to twenty-four years). During these years, prices dropped 10 per cent.[6] Thus, falling prices accounted for only 40 per cent of the decline in proceeds. This would imply a change in volume of 16.7 per cent,[7] since a combined decline of 10 per cent in price and of 16.7 per cent in volume would result in a total drop of about 25 per cent in proceeds. Thus, the results indicate that while instability in both price and volume are significant, the major contribution to instability in export earnings results from fluctuations in volume rather than in price.

In each of the forty-seven cases included in the table, the decline in proceeds was associated, without a single exception, with some decrease in prices. Moreover, in all except two of the forty-seven cases, there was also a decline in volume during years of falling

[6] Simple average of the forty-seven instances included in the table.

[7] Index of proceeds (75) divided by index of price (90) equals index of volume (83.3).

proceeds. Thus, prices and volume moved downward together, with a resultant drop in proceeds. The two exceptions were Korean silk and Argentine wool. In both of these cases the volume of exports increased during years of falling proceeds, but only by one per cent in the case of Argentine wool and by 5 per cent in the case of Korean silk. The latter exception is minimized by the fact that there were only seven years of falling proceeds during the period covered in the study.

The proportion in which declines in price contributed to the decrease in proceeds is given in table 39. Column 4 of the table shows that, in a number of cases studied, the relative contribution of price declines was within six or seven points of the over-all average of 40 per cent. The instances — apart from Argentine wool and Korean silk, mentioned above — where prices contributed significantly more (75 per cent or over) and volume correspondingly less, were the cases of coffee from countries other than Brazil, hemp from the Philippines, petroleum from the Middle East, and wool from Uruguay. Cases where the effect of the decline in price was significantly small (under 25 per cent) relative to that of the decrease in volume were tea from China, cotton from Brazil and China, linseed from Argentina, India and Pakistan and French Morocco, tobacco from Algeria, wheat from Argentina, sodium nitrate from Chile and rice from Thailand.

Table 39 further indicates that about three-quarters of the year-to-year decreases which have been separately recorded for price and for volume have combined to produce falling proceeds, since there was an average price decline of 10 per cent in years of falling proceeds, compared with a general average price fluctuation of 13.7 per cent, on the one hand, and an implied decline of 16.7 per cent in volume, compared with a general average year-to-year fluctuation of 18.7 per cent in volume.

Analysis of the relation between decreases in prices and receipts in years of falling proceeds in the case of 170 specified subdivisions of commodities exported by under-developed countries to the United States showed somewhat different results (see table III in appendix D). In the case of sales of precisely defined grades or varieties of commodities in the single market, in years of falling receipts, the drop in prices contributed only 5.8 per cent, or about one-sixth of the average 36.3 per cent decline in proceeds in years of falling receipts — compared with two-fifths for more broadly defined commodities and for sales in all markets. Thus, instability in volume was the dominant factor. The absence of year-to-year price declines alone would have prevented comparatively little of the loss in export earnings. However, the great majority in the series of commodity subdivisions — 124 of the 170 — showed a decrease in average unit values in years of falling proceeds, indicating that price declines contributed to falling proceeds, but this relation did not invariably obtain as it did for the broadly defined commodities. Forty-six items rose in unit value in years of falling proceeds.

In 701 of the 1,526 observations summarized in appendix table III, both unit values and quantities fell; in 597 cases, volume alone declined; in 228 cases, only prices decreased. Thus, in about 46 per cent of the cases, both volume and prices fell; in 39 per cent, quantity alone dropped; and prices alone declined in only 15 per cent. The volume therefore decreased in 85 per cent of all cases of falling proceeds (46 per cent plus 39 per cent), while prices declined in only 61 per cent of the cases (46 per cent plus 15 per cent).

This further illustrates the greater importance of declines in volume in reducing proceeds, and confirms the previous conclusion that when specific grades and varieties of primary commodities are considered, fluctuations in volume appear to be a more important cause of instability than price fluctuations.

In table II in appendix D, declines in unit value and corresponding year-to-year fluctuations in proceeds are shown for 162 items. It was found that the average decline in unit value of 16.5 per cent was accompanied by a decline in proceeds of 8.3 per cent. Of the cases studied, about 30 per cent showed a rise in proceeds, indicating a more than proportionate change in volume in the opposite direction to that of prices. On the other hand, the decline in proceeds in 23 per cent of the cases was greater than the decrease in unit value, indicating a drop in both volume and price. In 53 per cent of the cases, the drop in price was associated with a much smaller decrease in proceeds, thus indicating a rise in volume, though insufficient to offset the decline in price. The relation between the direction of change in price and in volume was therefore inconclusive.

A somewhat closer relationship appeared in the analysis of individual, rather than average, year-to-year observations. This analysis revealed a small positive correlation between year-to-year changes in unit value and in volume, indicating that price and volume tended to move in the same direction. This was true of 682 individual cases of the 1,495 observations summarized in appendix table II. There was a marked tendency for falling prices to be related to falling proceeds, since in over two-thirds of the cases analysed export proceeds fell when prices fell.

In the case of individual grades and varieties of primary commodities, therefore, it appeared that year-to-year changes in volume were the governing factor in variations in proceeds; such changes in volume were not closely related to prices but seemed to be caused by shifts in demand and other external factors. When prices fell, however, proceeds also fell, since volume did not expand sufficiently to compensate for falling prices. The cumulative effect of changes in price, volume and proceeds resulted in part from movements in

volume large enough to overcome the effects of changes in price in the opposite direction.

Cyclical movements

As in the case of year-to-year fluctuations, cyclical movements in volume and in price together resulted in greater instability in proceeds. Some of the movements appeared to be compensatory, however, since fluctuations in proceeds, though greater than those in price or volume alone, were less than they might have been if prices and quantities had always moved in the same direction. Cyclical fluctuations in price and volume reinforced each other to the extent that about half the gross variation in volume was in the same direction as that of price, and so added to the instability of proceeds. This was similar to the relationship in the case of year-to-year fluctuations.

Price stabilization alone, without stabilization in volume, would therefore have reduced the cyclical instability of proceeds by only one-fourth. Similarly, stabilization in volume without price stabilization would have reduced the cyclical instability of proceeds by only one-third. In both cases — other things being equal — the major part of existing cyclical instability would have remained in spite of such partial stabilization.

In attempting to evaluate the possible effects of price stabilization alone, or volume stabilization alone, on stability of proceeds from exports of the eighteen commodities listed in table 35, which shows comparative cyclical movements, it was found that stabilization of volume alone would have diminished the instability of proceeds from eleven of the commodities by less than two-fifths. These commodities included the beverages (cocoa, coffee, tea) and the fibres (cotton, hemp, jute, silk and wool) as well as rice, sugar and petroleum. In five of the remaining seven commodities — copper, linseed, rubber, tin and tobacco — the degree of instability would still have been about half the amount of instability actually measured. In only two commodities — sodium nitrate and wheat — would instability of proceeds have been reduced by over three-fifths.

If prices alone had been stabilized, in the great majority of commodities — sixteen of the eighteen — cyclical variations in proceeds would have been reduced by less than two-fifths; in the case of wheat and linseed, the instability of proceeds would have been even greater. The only two commodities for which instability of proceeds would have been significantly reduced by the elimination of price variations were silk and wool.

Long-term trends

As in the case of the other measures of fluctuation, long-term trends in volume and proceeds were of a cumulative nature, that is, the instability in proceeds was greater than the instability in price or in volume alone. The cumulative effect, however, was less than in the case of year-to-year fluctuations and cyclical movements. Long-term trends in proceeds did not follow the formula $X + \frac{1}{2} Y$, which applied to year-to-year and cyclical changes;[8] they were closer to the formula, $X + \frac{1}{3} Y$.

Elimination of long-term price trends with retention of long-term trends in volume would have reduced the long-term instability of proceeds by between 20 and 50 per cent for eight of the seventeen commodities. For four commodities — cocoa, coffee, hemp and wool — most of the long-term instability in proceeds would have been eliminated. In the case of five — cotton, linseed, petroleum, rice and rubber — long-term stabilization of prices would not have materially changed the long-term instability of proceeds. Similarly, by stabilizing volume alone, only seven commodities would have gained appreciably in long-term stability of proceeds (by a reduction in instability of between 20 and 50 per cent), and in only two cases — hemp and sodium nitrate — would the greater part of the instability have been reduced.

[8] If X represents fluctuation in price and Y, fluctuation in volume.

Chapter 6

FLUCTUATIONS IN EXPORT PROCEEDS IN RELATION TO OTHER METHODS OF OBTAINING FOREIGN EXCHANGE

In the preceding two chapters, the fluctuations of foreign exchange proceeds obtained from exports have been examined. Chapter 6 analyses the relation between foreign currency earnings from export proceeds and amounts obtained through capital inflow and on current "invisible account". The elements of earnings on current invisible account included service earnings or payments for past capital investments or for services to foreign governments; and donations, such as private gifts, official grants and transfers of migrants' earnings or property, valued in cash.

The analysis in this chapter has two aims: (1) to discover whether capital movements tended to stabilize or to aggravate fluctuations in balances of payments resulting from changes in export proceeds; (2) to appraise the importance of export proceeds as a source of foreign exchange, compared with foreign currency receipts obtained by under-developed countries from capital movements and invisible earnings. Lack of adequate data limited this analysis to two periods: the twelve years preceding the war, 1927 to 1938, and the post-war years 1946 to 1950.

Relative Importance of Export Proceeds Compared with Other Foreign Exchange Earnings during 1927 to 1938

Because of the scarcity of comparable balance of payments data for any but the most recent years, it is difficult to present an adequate statistical series of capital movements for a long period. The data for the inter-war years used in this analysis are limited both as to number of years and as to number of countries covered. The sample, however, adequately illustrates year-to-year fluctuations in capital inflow and export proceeds for a full cycle (1927 to 1938). Capital inflow, shown on a gross basis, comprises the inflow of long-term capital only, in order to eliminate capital movements related to balance of payments pressures (compensatory financing), which up to 1940 were included in short-term capital movements on capital account. Compensatory financing was excluded from capital movements in this analysis because it could not be regarded as foreign exchange normally available for financing imports and investment.

The relative importance of long-term capital inflow compared to export proceeds in earning foreign exchange can be seen from table 40. For most of the countries listed in the table the proportion of capital inflow to export proceeds varied between 10 and 15 per cent. During the period as a whole, New Zealand had the lowest proportion, capital inflow being less than 8 per cent of export proceeds; Australia had the highest, approximately 15 per cent. In the case of Iraq, the high proportion of capital inflow to export proceeds was probably due to the fact that the figures were not strictly comparable; those for export proceeds excluded the value of oil exported by concessionaires which did not accrue to Iraq, while capital inflow probably included capital invested in oil production. In general, the share of foreign capital in funds available to finance imports — and therefore to finance development — was small compared to export proceeds.[1]

In addition to export proceeds and capital inflow, table 40 shows year-to-year fluctuations in each, as well as fluctuations in all foreign exchange accruals (the sum of export proceeds, capital inflow and invisible earnings). It shows clearly that foreign exchange receipts from capital inflow were much less stable from year to year than foreign exchange receipts from exports; the range of individual fluctuations was much wider in the case of capital movements. It should be noted, however, that in many instances the amounts involved in capital movement were small in absolute figures; thus, important changes in percentages sometimes represent comparatively small absolute amounts.

The greater year-to-year instability of capital movements as compared with fluctuations in export proceeds is demonstrated even more strikingly in table 41 below, which summarizes for each country the arithmetic mean of year-to-year fluctuations in each of the two items for the period 1927 to 1938, without taking into account the direction of particular movements;[2] and the average amplitude of fluctuations during years of falling export proceeds and of decreasing capital inflow.

[1] In the case of the Union of South Africa the high proportion of capital inflow to export proceeds is due to the one exceptional year 1934, when capital inflow was at almost the same level as export proceeds as a result of devaluation.

[2] The direction of the movements in the first and third columns is, of course, partly taken into consideration in the fifth column. Each fluctuation has been expressed as a percentage of the higher of the two points compared, as in other computations.

Table 40. Year-to-Year Fluctuations in Export Proceeds, Net Long-Term Capital Flow and Total Foreign Exchange Receipts, Selected Countries, 1927 to 1938

(Millions of local currency, except as noted)

County, unit of currency and period	Export proceeds		Capital inflow[a]		Invisible earnings on current account (5)	Total (columns 1 + 3 + 5) (percentage fluctuation) (6)
	Total (1)	Percentage fluctuation (2)	Total (3)	Percentage fluctuation (4)		
Argentina (Argentine paper peso):[b]						
1926	1,824		252		18	
1927	2,324	22	285	12	20	20
1928	2,428	4	244	−14	28	2
1929	2,176	−10	80	−63	25	−16
1930	1,414	−35	483	83	17	−16
1931	1,475	4	68	−86	38	−17
1932	1,305	−12	15	−78	24	−15
1933	1,141	−13	313	95	34	10
1934	1,618	30	212	−32	43	20
1935	1,726	6	157	−26	48	3
1936	1,851	7	344	54	49	14
1937	2,485	26	90	−74	45	14
Australia (pound sterling):						
1927/28	140.4		..		..	
1928/29	138.6	−2	23.7	..	15.7	..
1929/30	98.2	−29	39.8	41	15.9	−14
1930/31	77.0	−22	36.9	−7	13.3	−17
1931/32	75.8	−2	5.6	−85	10.4	−28
1932/33	78.5	4	5.3	−5	8.4	—[c]
1933/34	90.7	14	6.4	17	8.4	13
1934/35	82.1	−9	10.3	38	9.4	−4
1935/36	98.6	17	7.6	−26	9.6	12
1936/37	117.9	16	5.2	−32	9.7	12
1937/38	123.3	4	10.1	49	..	
India and Pakistan (rupee):						
1927/28	3,529		182		140	
1928/29	3,663	4	145	−21	127	2
1929/30	3,405	−7	204	29	190	−4
1930/31	2,443	−28	384	47	138	−22
1931/32	1,740	−29	358	−7	128	−25
1932/33	1,460	−16	128	−64	120	−23
1933/34	1,535	5	254	50	161	12
1934/35	1,607	5	37	−85	148	−8
1935/36	1,701	6	134	72	132	9
1936/37	2,175	22	3	−98	283	20
1937/38	2,150	−6	166	98	109	−2
Indonesia (gulden):						
1927	1,668		35		17	
1928	1,603	−4	103	66	19	−1
1929	1,466	−9	59	−43	19	−11
1930	1,174	−20	180	67	22	−11
1931	756	−36	103	−43	11	−35
1932	548	−28	104	1	10	−24
1933	474	−14	117	11	9	−9
1934	535	11	151	23	10	14
1935	492	−8	8	−95	20	−25
1936	614	20	12	75	25	20
1937	994	38	25	52	28	37
1938	691	−31	12	−52	22	−31
Iraq[d] (Iraqi dinar):						
1927/28	4.6		0.9		2.6[e]	
1928/29	4.1	−10	0.5	−48	2.4	−14
1929/30	4.1	—	0.6	20	2.2	−1
1930/31	2.8	−33	0.7	17	1.9	−21
1931/32	2.8	1	0.3	−61	2.8[f]	7
1932/33	2.1	−26	1.5	82	2.4	2

Table 40 (*continued*)

Country, unit of currency and period	Export proceeds		Capital inflow[a]		Invisible earnings on current account (5)	Total (columns 1 + 3 + 5) (percentage fluctuation) (6)
	Total (1)	Percentage fluctuation (2)	Total (3)	Percentage fluctuation (4)		
Iraq (Iraqi dinar) (*cont'd*):						
1933/34	2.5	16	1.8	14	2.4	10
1934/35	3.6	31	0.9	−50	2.9	10
1935/36	3.1	−13	0.7	−25	2.9	−10
1936/37	4.4	30	1.1	38	2.9	21
1937/38	5.1	13	1.9	44	3.3	18
New Zealand (pound sterling):						
1927/28	54.4		7.2		3.2	
1928/29	56.0	3	11.0	34	2.6	7
1929/30	47.5	−1	6.6	−40	2.9	−18
1930/31	34.8	−27	7.7	14	3.4	−19
1931/32	30.5	−13	4.9	−36	2.1[e]	−19
1932/33	31.7	4	—[b]	−100	2.1[e]	−10
1933/34	36.1	12	—[b]	−29	2.1	12
1934/35	35.6	−1	0.8	99	2.4	2
1935/36	38.9	9	—[b]	−96	2.6	7
1936/37	47.2	17	0.2	99	2.7	17
1937/38	51.1	8	—[b]	−98	3.3	8
Union of South Africa (South African pound):						
1927	51.6		6.5		2.9	
1928	52.5	2	2.8	−66	3.1	−4
1929	51.5	−2	0.9	−69	3.2	−5
1930	35.9	−30	10.1	91	3.1	−12
1931	25.7	−29	1.4	−86	2.5	−40
1932	20.5	−30	4.7	70	2.0	−8
1933	25.4	19	1.3	−73	2.4	7
1934	26.4	4	21.5	94	2.8	42
1935	31.4	16	13.6	−47	3.1	−5
1936	32.4	3	13.5	−1	3.6	−3
1937	43.1	25	7.7	−43	3.0	8

Source: Based on data contained in League of Nations, *Balance of Payments* (series for 1928 through 1938), Geneva.

[a] Gross capital inflow, comprising long-term capital only.

[b] Data on foreign exchange proceeds supplied by the Government of Argentina.

[c] Increase of 0.4 per cent.

[d] Export proceeds exclude oil products exported by concessionaire companies the value of which is not received in Iraq. Silver coin included up to 1931/32 in capital account, but excluded in subsequent years.

[e] Including disbursements by British forces in Iraq.

[f] Oil royalties included for the first time in 1931/32 (about one-quarter of the total).

[g] For 1931/32, £2,091,000; for 1932/33, £2,085,000.

[h] Under one million. For 1932/33, £7,000; 1933/34, £5,000; 1935/36, £30,000; 1937/38, £5,000.

Fluctuations in capital inflow were most evident in the case of India and Pakistan and of New Zealand, but the average year-to-year variations of capital inflow were never less than double those of export proceeds (tables 40 and 41). The conclusion that foreign exchange receipts from exports were relatively steadier in magnitude than foreign currency receipts from capital inflow was also supported by a survey of countries not included in the table.

The data given in table 40 show no single pattern of relationship between changes in capital movements and changes in export proceeds. The year-to-year movements for Indonesia and Iraq indicate export proceeds and capital inflow fluctuating in the same direction for more than half of the total number of years. On the other hand, data for Argentina, Australia, India and Pakistan, New Zealand and the Union of South Africa show a steadying effect of capital movements for two-thirds of the years studied, with export proceeds and capital fluctuating in opposite directions. Thus, capital movements offset the disturbing effects of very uneven receipts from exports to a degree which depended on

Table 41. Summary of Year-to-Year Fluctuations in Export Proceeds and Net Capital Flow, Selected Countries, 1927 to 1938

(Average percentage fluctuation per year)

Country	Export proceeds		Capital inflow		Export proceeds and capital inflow combined
	All years	Years of falling proceeds	All years	Years of decreasing flow	All years
Argentina	15	17	56	53	14
Australia	13	15	27	31	11
India and Pakistan	13	17	57	55	13
Indonesia	22	18	48	58	20
Iraq	17	16	40	46	16
New Zealand	11	14	65	66	12
Union of South Africa	16	23	64	55	14

the relative importance of capital inflow compared to export proceeds; as table 40 shows, however, the degree to which they offset the fluctuation was usually minor.

The main characteristic of capital inflow, however, lay in its erratic movements from year to year and from country to country. Governed by political factors and by more complex economic factors than prices and the demand for primary products, capital movements into primary producing countries seemed to have only a remote link with year-to-year changes in the volume and value of exports. They were, however, highly sensitive to cyclical movements during the period under review. This may be seen in table 42, which sets out the turning points of a cycle established from the data on which table 40 was based.

Table 42. Cyclical Movements in Export Proceeds and Net Capital Flow, Selected Countries, 1927 to 1938

Country and item	First peak	Trough	Second peak
Argentina:			
Export proceeds ...	1928	1933	1937
Capital inflow	1930	1932	1936
Australia:			
Export proceeds ...	1928/29	1931/32	1937/38
Capital inflow	1929/30	1932/33	1934/35 and 1937/38
India and Pakistan:			
Export proceeds ...	1928/29	1933/34	1936/37
Capital inflow	1930/31	1934/35	none
Indonesia:			
Export proceeds ...	1927	1933	1937
Capital inflow	1930	1935	none
Iraq:			
Export proceeds ...	1927/28	1932/33	1937/38
Capital inflow	1927/28	1930/31	1937/38
New Zealand:			
Export proceeds ...	1928/29	1931/32	1937/38
Capital inflow	1928/29	1929/30 and 1933/34	none
Union of South Africa:			
Export proceeds ...	1928	1932	1937
Capital inflow	1927 or 1930	1933	1936

Source: See table 40.

Though the timing of cyclical movements for export proceeds and capital inflow coincided to a high degree, the amplitude of the downswing was far larger for capital movements, almost amounting at times to a disappearance of all foreign lending. The differing range of the downswing for the two items is illustrated below (expressed as a percentage range from peak to subsequent trough):

Country	Export proceeds	Capital inflow
Argentina	53	94
Australia	45	87
India and Pakistan	60	80
Indonesia	72	95
Iraq	55	70
New Zealand	46	100
Union of South Africa	60	87

Between 1929 and 1933 there occurred a definite break in the flow of foreign investment funds to under-developed countries. After the low point in 1933, receipts from exports started a cyclical recovery which culminated in a 1937 peak; capital inflow, however, continued at a low rate. Of the countries studied, Argentina, Australia, India and Pakistan and the Union of South Africa showed a slight upward trend, but, except for the Union of South Africa, the highest points reached by these countries in or about 1937/38 were from 32 per cent to 75 per cent lower than the peaks of the 1929 to 1931 period. This sharp decline in foreign lending in the nineteen thirties has never been reversed to any significant degree; in consequence, in recent years foreign exchange receipts of under-developed countries have depended still more upon earnings from exports than upon capital inflow.[3]

Another source of foreign exchange — invisible earnings on current account — is shown, on a gross basis,

[3] See table 43.

in table 40 for comparison with export proceeds and capital inflow. If invisible earnings were shown on a net basis, they would be negative in most cases, since the amount of services bought by under-developed countries is generally far greater than the amount of services sold. This applies particularly to service charges for capital. During the years 1928 to 1938 current invisible gross earnings for primary producing countries were between one per cent and 3 per cent of export proceeds. For Australia, India and Pakistan and the Union of South Africa, however, with more highly developed "intermediary" services, invisible earnings were as high as 10 per cent of export proceeds for certain years. Although in the sample presented in table 40 foreign currency receipts on invisible account tended to be more stable than export proceeds, their movements as a rule closely followed fluctuations in export proceeds. This was to be expected because the largest recurrent part of invisible earnings is a function of the volume and value of trade.[4]

Relative Importance of Export Proceeds Compared with Other Foreign Exchange Earnings during 1946 to 1950

For the post-war years more adequate data are available from the balance of payments yearbooks compiled by the International Monetary Fund. The value of generalizations from the data is, however, limited by the shortness of the period covered, as well as by the fact that two of the five years under review (1946 and 1947) reflected distorted conditions with respect to capital movements in the period immediately following the Second World War.

Export proceeds and their fluctuations, net long-term capital flow and total capital movements, net investment income, as well as invisible earnings, have been examined for nineteen under-developed countries (tables 43, 44 and 45). The data contained in these tables make it clear that the supply of capital as a source of foreign exchange to under-developed countries has become even less significant since the Second World War than in the inter-war period, both in absolute terms and in relation to export proceeds. For a large number of under-developed countries net capital movements were negative, thus diminishing foreign exchange holdings. This was particularly the case when service payments for previous capital inflow were taken into consideration (table 43); in a number of cases where the movement of investment capital in itself was positive, the end result was an outflow because of debt service payments.[5]

In the immediate post-war period, movements of capital as well as debt service charges were to some extent the direct consequence of restrictions prevailing during the war. In 1946 and 1947, for example, governments caught up with amortization payments for the war years and resumed debt service, paying accumulated arrears. In addition, many under-developed countries, such as Argentina, Cuba, the Dominican Republic and El Salvador, pursued a policy of foreign debt retirement after the war, taking advantage of foreign exchange holdings accumulated during the war. In other countries, such as India, a change in the political structure after the war caused abnormally heavy capital outflow. Nevertheless, after making allowance for such exceptional circumstances, the fact remains that investment capital from abroad did not contribute much towards the foreign exchange resources of under-developed countries during the years 1946 to 1950, and thus they had to rely almost entirely on export earnings to finance imported equipment and supplies needed for development.

Table 43, giving export proceeds, net long-term capital movement and net investment payments, shows that, for those countries where the net movement of investment capital was positive, it seldom exceeded 10 per cent of export proceeds on an average. For a great number of countries it was substantially lower. For some — Costa Rica and Honduras — where the percentage was higher, it involved small amounts. In the Philippines, grants and compensatory payments from the United States for damages suffered during the war were responsible for the large inflow of capital. Such items, however, were of a non-recurrent nature. Countries where long-term investment capital amounted to more than 10 per cent of export proceeds were the exception, and such an inflow was chiefly occasioned by the development of resources particularly suited for exports, such as oil in Iraq.

The debt service charges of the under-developed countries considered in table 43 constituted a currency outflow for all countries except pre-partition India (in 1946 and 1947). In addition to factors already discussed, affecting debt service payments in 1946 and 1947, such payments during the years 1947 to 1950 were affected by two factors working in opposite directions. Service payments were somewhat reduced owing to voluntary foreign debt retirement chiefly affecting

[4] Except where remittances and donations form an important part of invisible earnings.

[5] Another aspect of the debt burden is treated in *Investment Service of Under Developed Countries* by David Finch (International Monetary Fund, Staff Papers, vol. II, no. 1, September 1951, Washington, D.C.). This study analyses the capacity of under-developed countries to service investments of foreign capital by examining the ratio of investment income payments in relation to gross receipts on current account as represented by exports of goods and services plus donations.

Table 43. Foreign Exchange Receipts from Exports, Long-Term Capital Movements[a] and Investment Income, Selected Countries, 1946 to 1950

(Millions of local currency, except as noted)

Country, unit of currency and item	*1946*	*1947*	*1948*	*1949*	*1950*
Argentina (Argentine peso):					
Export proceeds	3,918	5,421	5,463	3,467	..
Long-term capital	−1,102	−511	−2,052	31	..
Debt service	−451	−276	−34	−37	..
Ceylon (Ceylon rupee):					
Export proceeds	732	854	1,006	1,013	1,470
Long-term capital	19	314	12	16	..
Debt service	−77	−68	−49	−29	−47
Chile:[b]					
Export proceeds	234	287	342	265	298
Long-term capital	13	−32	15	74	2
Debt service	−38	−57	−73	−52	−59
Colombia:[b]					
Export proceeds	201	254	286	319	394
Long-term capital[c]	15	−23	24	−1	—
Debt service	−4	−8	−6	−14	−40
Costa Rica:[b]					
Export proceeds	22	32	45	47	..
Long-term capital	7	7	3	4	..
Debt service	−2	−1	−9	−11	..
Cuba (Cuban peso):					
Export proceeds	535	773	724	593	657
Long-term capital	−15	−71	−16	−8	−16
Debt service	−40	−74	−51	−30	−36
Dominican Republic:[b]					
Export proceeds	67	83	82	74	83
Long-term capital	6	−11	−5	—	−2
Debt service	−15	−18	−16	−12	−12
Ecuador:[b]					
Export proceeds	38	42	49	36	73
Long-term capital	8	2	9	7	2
Debt service	−1	−1	−3	−3	−4
Egypt (Egyptian pound):					
Export proceeds	53	68	133	142	190
Long-term capital	−8	−25	−13	−4	−4[d]
Debt service	−9	−5	−3	−9[e]	−11[e]
El Salvador (Salvador colon):					
Export proceeds	63	99	112	140	..
Long-term capital	−5	−7	−1	−1	..
Debt service	−2	−2	−3	−3	..
Ethiopia (Ethiopian dollar):					
Export proceeds	59	87	84	78	72
Long-term capital	3	−8	2	9	−1
Debt service	−1	−1	−1	−2	−2
Guatemala:[b]					
Export proceeds	52	66	67	63	79
Long-term capital	1	−4	3	3	—
Debt service	−8	−5	−7	—	..
Honduras:[b]					
Export proceeds	32	47	54	60	61
Long-term capital	6	10	10	11	10
Debt service	−8	−19	−23	−26	−26
India (rupee):					
Export proceeds	3,468[f]	4,735[f]	4,337[f]	4,260[f]	5,401[f]
Long-term capital	−338	−2,294	−2,361	−123	−49
Debt service	13	54	−178	−179	−228

Table 43 (*continued*)

Country, unit of currency and item	*1946*	*1947*	*1948*	*1949*	*1950*
Iran[b] (rial[1]):					
Export proceeds	10,294	11,595	19,007	16,633	..
Long-term capital	−807	−344	−526	−838	..
Debt service	−4,716	−6,361	−12,689	−8,921	..
Iraq (Iraqi dinar):					
Export proceeds	26	31	22	29	..
Long-term capital	—[f]	6	19	10	..
Debt service	−7	−6	−2	−6	..
Mexico:[b]					
Export proceeds	364	461	461	435	534
Long-term capital	−3	−63	−11	−11	−30
Debt service	−42	−77	−62	−67	−51
Peru:[b]					
Export proceeds	136	156	163	167	195
Long-term capital	5	−12	12	−1	−1
Debt service	−18	−11	−13	−11	−15
Philippines (Philippine peso):					
Export proceeds	162	540	654	522	674
Long-term capital	116	146	77	3	−2[k]
Debt service	−3	−40	−54	−60	−30[k]

Source: International Monetary Fund, *Balance of Payments Yearbook* (Washington, D.C.).

[a] Net long-term capital, both private and official. The following amounts included in the table are classified by the International Monetary Fund as "compensatory financing":

Argentina (millions of Argentine pesos), 1946, −773; 1947, −377; 1948, −2,071 (non-contractual redemption of foreign debts, that is, repurchase of foreign direct investments by the Argentine Government).

Ceylon (millions of Ceylon rupees), 1946, +53; 1947, +329; 1948, −5; 1949, +57 (". . . changes in surplus government funds invested or deposited abroad and in long-term investments held by the Currency Board and the banks", International Monetary Fund, *Balance of Payments Yearbook*, 1951, page 108).

Chile (millions of United States dollars), 1947, +17 (Argentine loan associated with subsequent heavy purchases of food from Argentina); 1948, +5 (overdraft on compensation account with Brazil); 1949, +1; 1950, +12 (drawings on Export-Import Bank loan "since it was extended to enable Chile to maintain essential imports in the face of declining receipts from copper exports because of falling copper prices", International Monetary Fund, *op. cit.*, page 118).

Dominican Republic (millions of United States dollars), 1947, +12 (non-contractual debt retirement).

Egypt (millions of Egyptian pounds), 1946, −5; 1947, −5; 1948, −1; 1950, −3 (changes in the National Bank's holdings of long-term British securities).

India (millions of rupees), 1946, −40 and 1947, −10 (non-contractual repayments on loan to Thailand); 1949, +46 (loan to Thailand); 1946, −17, 1947, +106, 1948, +80, 1949, −65 and 1950, −19 (changes in foreign official holdings of rupee securities); 1949, +50 and 1950, +15 (changes in holdings of long-term British securities).

Iraq (thousands of Iraqi dinars), 1948, +5,012, and 1949, +655 (net sales of foreign securities by the National Bank of Iraq).

[b] Millions of United States dollars.

[c] Including only direct investment from the United States.

[d] Estimated.

[e] Including Suez Canal dividends, which were not included for earlier years.

[f] Pre-partition India.

[g] India only.

[h] Fiscal year beginning 21 March of year stated.

[i] Standard rial at the rate of US$0.031 per rial.

[j] 719,000 dinars.

[k] Excluding undistributed profits.

government obligations and other types of fixed interest debts. Increased profit and dividend payments due foreign companies on equity investments and resulting from greater export volume and higher prices acted in the opposite direction. In general, Argentina, Cuba and Guatemala had a decrease in service payments (table 43) possibly resulting from debt retirement policies pursued by their governments. A number of countries (Dominican Republic, Ecuador, Egypt, El Salvador, Iraq[6] and Peru), made fairly steady interest payments suggesting that the two opposing factors neutralized each other. Countries such as Chile, Colombia, Honduras, India, Iran and the Philippines made steadily increasing service payments which were approximately in line with the increase in their export proceeds.

[6] The sudden drop in service payments in 1948 is not explained in the Iraq balance of payments statement but it might result from failure to include profits which were not transferred abroad.

Table 44. Foreign Exchange Receipts from Exports, Current Invisible Earnings[a] and Net Long-Term Capital Flow, Selected Countries, 1946 to 1950

(Millions of local currency, except as noted)

Country, unit of currency and item	1946	1947	1948	1949	1950
Argentina (Argentine peso):					
Export proceeds	3,918	5,421	5,463	3,467	..
Invisible earnings	300	271	60	16	..
Capital flow (net)	−329	−134	19	44	..
TOTAL	3,889	5,565	5,542	3,527	..
Ceylon (Ceylon rupee):					
Export proceeds	732	854	1,006	1,013	1,470
Invisible earnings	228	115	163	187	..
Capital flow (net)	−39	−20	−13	−41	−18
TOTAL	921	949	1,156	1,159	..
Chile:[b]					
Export proceeds	234	287	342	265	298
Invisible earnings	28	28	31	31	32[c]
Capital flow (net)	−11	−7	19	30	7
TOTAL	252	308	392	326	337
Colombia:[b]					
Export proceeds	201	255	286	319	394
Invisible earnings	19	25	25	27	43
Capital flow (net)[d]	52	27	18	−3	8
TOTAL	272	307	329	343	445
Costa Rica:[b]					
Export proceeds	22	32	45	47	..
Invisible earnings	4	5	4	6	..
Capital flow (net)	4	11	8	−1	..
TOTAL	30	48	57	54	..
Cuba (Cuban peso):					
Export proceeds	535	773	724	593	657
Invisible earnings	33	49	62	52	60[c]
Capital flow (net)	−36	6	−17	−20	−23
TOTAL	532	828	769	625	694
Dominican Republic:[b]					
Export proceeds	67	83	82	74	83
Invisible earnings	6	7	6	6	7[c]
Capital flow (net)	−15	−5	8	−6	−9
TOTAL	58	88	86	74	82
Ecuador:[b]					
Export proceeds	38	42	49	36	73
Invisible earnings	4	5	4	9	9[c]
Capital flow (net)	1	−2	2	4	2
TOTAL	43	45	51	49	84
Egypt (Egyptian pound):					
Export proceeds	53	68	133	142	190
Invisible earnings	48	39	50	68	..
Capital flow (net)	2	−9	−3	−4	−2
TOTAL	103	98	180	206	..
El Salvador (Salvador colon):					
Export proceeds	63	99	112	140	..
Invisible earnings	6	13	10	12	..
Capital flow (net)	−8	−10	−2	−6	..
TOTAL	61	102	120	146	..

Table 44 (*continued*)

Country, unit of currency and item	*1946*	*1947*	*1948*	*1949*	*1950*
Ethiopia (Ethiopian dollar):					
Export proceeds	59	87	84	78	72
Invisible earnings	4	2	2	2	2[e]
Capital flow (net)	4	3	1	1	−1
TOTAL	67	94	91	81	73
Guatemala:[b]					
Export proceeds	52	66	67	63	79
Invisible earnings	3	6	7	6	..
Capital flow (net)	4	6	6	−7	−3
TOTAL	59	78	80	62	..
Honduras:[b]					
Export proceeds	32	47	54	60	61
Invisible earnings	..	..	1	2	3
Capital flow (net)	6	9	9	10	12
TOTAL	..	..	64	72	76
India (rupee):					
Export proceeds	3,468[f]	4,735[f]	4,337[g]	4,260[g]	5,401[g]
Invisible earnings	1,186	786	160	881	877
Capital flow (net)	−234	63	14	−158	−23
TOTAL	4,420	5,584	4,511	4,983	6,255
Iran[h] (rial[i]):					
Export proceeds	10,294	11,595	19,007	16,633	..
Invisible earnings	450	320	340	226	..
Capital flow (net)[j]	721	646	662	709	..
TOTAL	11,465	12,561	20,009	17,568	..
Iraq (Iraqi dinar):					
Export proceeds	26	31	22	29	..
Invisible earnings	12	9	9	8	..
Capital flow (net)	2	5	12	10	..
TOTAL	40	45	43	47	..
Mexico:[b]					
Export proceeds	364	461	461	435	534
Invisible earnings	196	223	236	237	250[e]
Capital flow (net)	18	50	23	8	86
TOTAL	578	734	720	680	870
Peru:[b]					
Export proceeds	136	156	163	167	195
Invisible earnings	19	17	21	49	50[e]
Capital flow (net)	13	21	2	5	2
TOTAL	168	194	186	221	247
Philippines (Philippine peso):					
Export proceeds	162	540	654	522	674
Invisible earnings	829	809	896	780	..
Capital flow (net)	−112	283	371	373	241
TOTAL	879	1,632	1,921	1,675	..

Source: International Monetary Fund, *Balance of Payments Yearbook*, country tables referring to financing of international transactions.

[a] Excluding non-monetary gold transactions; including donations and other remittances.

[b] Millions of United States dollars.

[c] Estimated.

[d] Including only direct investment from the United States.

[e] Excluding transactions connected with the currency reform.

[f] Pre-partition India.

[g] India only, excluding all transactions with Pakistan.

[h] Fiscal year beginning 21 March of year stated.

[i] Standard rial at the rate of US $0.031 per rial.

[j] Incomplete.

Considering how the flow of long-term capital, combined with service payments, affects the amount of foreign exchange available from year to year, it can be seen that this amount was often reduced by more than one-fourth through the net outflow of capital (for example, Argentina, 1948; Chile, 1947; Dominican Republic, 1947, 1948; Honduras, 1948, 1949; India, 1947, 1948; Iran, 1948, 1949). On the other hand, when the net result of capital movements was positive it added only in exceptional cases more than 10 per cent to foreign currency available from exports (table 43).

When fluctuations in export proceeds are analysed, it is evident that, expressed in national currencies, they showed a fairly continuous increase during the post-war years for a majority of countries.[7] Net capital movements, however, had no definite trend during these years, exhibiting particularly wide year-to-year fluctuations. The swings are emphasized in table 45 because total capital movements, both long-term and short-term, are presented on a net basis in table 44 and therefore include negative movements within the range of their fluctuations.[8] The numerous cases of negative capital movements shown in table 44 illustrate how often an inflow of funds has changed into a net outflow during recent years, because of contractual obligations or deliberate policy on the part of under-developed countries to maintain amortization payments on outstanding debts even while capital imports were declining.

By omitting capital outflow, and thus reducing all fluctuations of capital inflow to a maximum of 100 per cent, these can be made more nearly comparable to yearly changes in export proceeds (since export proceeds are on a gross basis, their maximum swings cannot exceed 100 per cent).[9] However, even then the range of changes in year-to-year capital flow is consistently wider than fluctuations of export proceeds (table 45).

Of the seventy-one individual year-to-year fluctuations examined (relating to nineteen countries), capital inflow reduced fluctuations of export proceeds in only twenty-seven instances. In twenty-two of the twenty-seven instances, however, capital movements achieved the stabilizing effect by "negative" action, that is, by reducing the amplitude of increases in export proceeds by means of a capital outflow. This may be described as a stabilizing effect of capital movements in an unfavourable direction at an inauspicious time. Only in Argentina, Chile, Ecuador and the Philippines did foreign lending partly offset the sharp decline in foreign currency receipts from exports in 1949 by providing a larger amount of capital during that year. This also happened in Iraq in 1948. The total amount of foreign exchange available from exports, invisible earnings and capital inflow combined fell by 17, 4 and 13 per cent in 1949 (as compared with 1948) for Chile, Ecuador and the Philippines, while export proceeds alone for these three countries during the same period had declined by 22, 26 and 20 per cent, respectively (table 45). In the case of Iraq in 1948, the fluctuation of capital inflow and export proceeds combined was 4 per cent, while it was 29 per cent for export proceeds alone.

The general experience in post-war years shows, therefore, that capital inflow fluctuated more widely than export proceeds and mostly in the same direction as export proceeds, thus aggravating the fluctuations of the latter. The data also suggest that in the post-war years, as during the 1927 to 1938 period, capital was usually attracted to under-developed countries at a time when their export prices were rising; any reversal of the upward trend led to a sharp decline in capital imports. During these years, as stated previously, there was often a net capital outflow because of continuous contractual payment obligations of under-developed countries (see data for 1949 and 1950, table 44), and, in consequence, capital movements failed to have a stabilizing effect on fluctuations of foreign currency holdings resulting from changing export proceeds.

Earnings on current invisible account during the post-war period grew in importance, both absolutely and in relation to export proceeds, as compared with the period 1927 to 1938. In Latin American countries particularly, receipts from tourist trade and transportation increased. In general, during the years 1946 to 1950, invisible earnings were equivalent to between 8 per cent and 15 per cent of export proceeds. For Mexico, Egypt and the Philippines, however, they reached much higher proportions. Mexico's tourist receipts were equivalent to approximately 40 per cent of export proceeds; Egypt's earnings from Suez Canal fees more than doubled because of increased traffic. Large Philippine receipts on current invisible account reflected various United States grants, a non-recurrent item.

Of the nineteen countries studied, earnings on invisible account were fairly stable from year to year for seven, the average amplitude of year-to-year fluctuations being slightly less than that of export proceeds. For the other countries, the swings were, on an average, wider than those of export proceeds, but smaller than those observed for capital movements. With few exceptions,[10] fluctuations in receipts on invisible account coincided with movements of export proceeds.

Fluctuations in total foreign exchange receipts from all three sources investigated were smaller than those

[7] If export values were expressed in United States dollars, instead of domestic currencies (often devalued), the economic setback of 1949 in a number of countries would be more evident.

[8] These also account for the occurrence of fluctuations of over 100 per cent since a shift from a negative figure to a positive figure will yield such a result.

[9] See appendix B.

[10] Where exceptions occurred, they were due to political factors particularly affecting tourist traffic and transportation.

in export proceeds alone in thirty out of seventy-one year-to-year observations (table 45). As in the case of capital movements, the amplitude of fluctuations in export proceeds was usually moderated in the upswing by outflows of capital, or a decline in capital inflow and earnings on invisible account combined. Only Argentina, Chile, Ecuador and the Philippines in 1949, and Ecuador and Iraq in 1948, provide instances of a moderating effect of earnings on invisible account at a time of lower export proceeds.

Table 45. Year-to-Year Fluctuations in Export Proceeds, Net Capital Flow and Total Foreign Exchange Receipts,[a] Selected Countries, 1946 to 1950

(Average percentage fluctuation per year[b])

Country and period	Export proceeds	Capital inflow (net)	Total exchange receipts[a]
Argentina:			
1947	28	59	30
1948	1	124	−1
1949	−46	77	−36
Ceylon:			
1947	14	49	3
1948	15	35	18
1949	1	−68	2
1950	31	56	..
Chile:			
1947	18	36	18
1948	16	137	21
1949	−22	37	−17
1950	11	−77	4
Colombia:			
1947	21	−48	11
1948	11	−33	7
1949	10	−116	4
1950	19	137	23
Costa Rica:			
1947	31	—	25
1948	29	−27	16
1949	4	−112	−5
Cuba:			
1947	28	117	36
1948	−6	−135	−7
1949	−18	−15	−19
1950	10	−13	10
Dominican Republic:			
1947	22	67	34
1948	—	162	−2
1949	−14	−175	−14
1950	12	−33	10
Ecuador:			
1947	9	−300	4
1948	14	200	12
1949	−26	50	−4
1950	51	−50	42
Egypt:			
1947	22	−122	−5
1948	49	67	46
1949	6	−25	13
1950	25	50	..
El Salvador:			
1947	36	−20	40
1948	11	80	16
1949	20	−67	18
Ethiopia:			
1947	34	−25	29
1948	−1	−68	−3
1949	−11	—	−11
1950	−8	−200	−10
Guatemala:			
1947	21	33	24
1948	1	—	3
1949	−6	−186	−23
1950	20	60	..
Honduras:			
1947	32	33	..
1948	13	—	..
1949	10	10	11
1950	2	17	5
India:			
1947	27	119	21
1948	−8	−78	−19
1949	−2	109	9
1950	21	85	20
Iran:[c]			
1947	11	−10	9
1948	39	2	37
1949	−12	7	−12
Iraq:			
1947	16	60	11
1948	−29	58	−4
1949	24	−17	9
Mexico:			
1947	21	64	21
1948	—	−54	−2
1949	−6	−65	−6
1950	18	91	22
Peru:			
1947	13	38	13
1948	4	−90	−4
1949	2	60	16
1950	14	−60	11
Philippines:			
1947	70	140	46
1948	17	24	−15
1949	−20	1	−13
1950	13	−35	..

Source: International Monetary Fund, *Balance of Payments Yearbook.*

[a] Including export proceeds, invisible earnings on current account and net capital inflow; excluding foreign exchange earnings from monetary and non-monetary gold transactions.

[b] Percentage change from preceding year.

[c] Fiscal year beginning 21 March of year stated.

APPENDICES

Appendix A

Sources of Statistical Data

The principal sources utilized in respect of the eighteen selected primary commodities are listed below. Import unit values were obtained in each case from the *Statistical Abstract of the United States*, published by the United States Department of Commerce (Washington, D. C.). Information regarding market prices was secured from the following: the Sauerbeck-Statist index of wholesale prices, published in the *Journal* of the Royal Statistical Society (London); United States Bureau of Labor Statistics index of wholesale prices; *Commodity Markets, 1937*, published by H. Hertz and Company (New York); and special publications relating to particular commodities. The principal sources for statistics on production and exports were the statistical yearbooks of the International Institute of Agriculture (Rome); the statistical yearbooks and other publications of the Food and Agriculture Organization of the United Nations (Rome); the League of Nations statistical yearbooks; statistical yearbooks published by the Statistical Office of the United Nations (New York); United States Department of Commerce, *Report No. FT 110* and *Foreign Commerce and Navigation of the United States* (Washington, D. C.), as well as special publications relating to particular commodities. Additional sources for certain specific commodities are listed below.

Coffee: V. D. Wickizer, *World Coffee Economy* (Food Research Institute, Stanford University, California, 1943); International Institute of Agriculture, *World's Coffee* (Rome, 1947); Pan American Coffee Bureau, *Coffee Statistics* (New York); and Commonwealth Economic Committee, *Plantation Crops, 1948* (London).

Copper: United States Department of the Interior, *Minerals Yearbook, 1950* (Washington, D. C.) and *Mineral Resources of the United States* (yearbook).

Cotton: International Cotton Advisory Committee (Washington, D. C.); United States Bureau of Agricultural Economics, *Statistics on Cotton and Related Data* (Washington, D. C., 1951).

Jute: Indian Jute Mills Association, *Annual Report* (Calcutta).

Petroleum: World Oil (Gulf Publishing Company, Houston, Texas), 15 July 1950; *Petroleum Data Book*, 1948 (Petroleum Engineer Publishing Company, Dallas, Texas.

Rubber: International Rubber Study Group, *Rubber Statistical Bulletin* (London); K. E. Knorr, *World Rubber and Its Regulation* (Food Research Institute, Stanford University, California, 1945); Commodity Research Bureau, *Commodity Yearbook* (New York).

Silk: International Institute of Agriculture, *La Sériculture dans le monde* (Rome).

Sodium nitrate: Chile, Dirección General de Estadística, *Estadística Chilena* (Santiago).

Sugar: International Bank for Reconstruction and Development, *Sugar: A Brief Review of Trends in Production, Trade and Consumption* (Washington, D. C.); Cuba, *Anuario Azucarero* (Havana, 1950).

Tea: International Tea Committee, *Bulletin of Statistics* (London).

Tin: International Tin Study Group, *Statistical Yearbook, 1949* (The Hague).

Appendix B

Method of Measuring Fluctuations

Because of difficulties inherent in the use of the conventional method of computing percentage increases, which measures a rise as a percentage of the lower starting point, it was considered desirable to adopt a different method of measurement for the purposes of the present study. In this report, a rise was measured as a percentage of the terminal high point, rather than of the lower starting point, of an increase. Thus, a rise from 100 to 150 was not considered an increase of 50 per cent, that is, 50 in relation to 100, but as an increase of 33⅓ per cent, that is, 50 in relation to 150.[1] The conventional method of measuring decreases was retained, that is, the decline was measured as a percentage of the higher starting point.

The reasons for the change from the conventional method of measurement may be summarized briefly as follows.

[1] This method was not employed in the earlier mimeographed version of the report, and the computations in the two reports are therefore not comparable.

Chilean Copper: Year-to-Year Fluctuations in Retained Export Proceeds, 1928 to 1948

Year	Output[b] (thousands of metric tons) (1)	United States market price (cents per pound) (2)	Export proceeds (thousands of US dollars) (3)	Foreign exchange retained[a]			Average percentage fluctuation per year					
				United States cents per pound (4)	Thousands of United States dollars (5)	As percentage of proceeds (6)	Output (column 1) (7)	United States market price (column 2) (8)	Export proceeds (column 3) (9)	Foreign exchange retained: US cents per pound (column 4) (10)	Foreign exchange retained: Thousands of US dollars (column 5) (11)	Foreign exchange retained: As percentage of proceeds (column 6) (12)
1928	287	14.7	10,022	3.2	2,205	22						
1929	321	18.2	18,941	3.2	2,273	12	11.9	24.2	45.3	0.3	12.2	− 45
1930	220	13.1	6,181	2.8	1,360	22	− 31.5	− 28.1	− 43.8	− 13.0	− 40.2	83
1931	224	8.2	3,973	2.4	1,192	30	1.8	− 37.2	− 34.4	− 14.0	− 12.3	36
1932	103	5.7	1,244	2.5	560	45	− 54.0	− 31.3	− 69.1	2.2	− 58.0	50
1933	163	7.2	2,416	1.7	604	25	58.3	26.3	71.8	− 32.0	7.8	− 44
1934	257	8.5	4,139	1.7	952	23	57.7	19.3	78.3	—	57.5	− 8
1935	267	8.8	4,521	1.8	1,040	23	3.9	2.5	2.3	5.2	9.3	—
1936	256	9.6	5,159	2.5	1,393	27	− 4.1	9.4	15.2	40.9	35.1	17
1937	413	13.3	11,834	3.4	3,077	26	61.3	38.6	127.7	35.8	119.1	− 4
1938	352	10.1	8,170	3.9	3,023	37	− 14.8	− 23.9	− 33.0	15.3	− 1.7	42
1939	341	11.1	8,075	4.0	2,988	37	− 3.2	9.5	1.1	2.0	− 1.2	—
1940	365	11.4	8,534	4.4	3,499	41	6.4	3.1	11.0	10.0	17.1	11
1941	469	11.9	10,935	4.5	4,593	42	29.2	4.1	27.8	1.6	31.3	2
1942	484	11.9	12,574	5.9	6,287	50	3.2	—	3.9	32.6	36.9	19
1943	497	11.9	12,907	6.4	6,970	54	2.7	—	7.9	8.0	10.9	8
1944	499	11.9	12,648	6.5	7,083	56	0.4	—	3.2	1.2	16.3	4
1945	470	11.9	12,018	6.2	6,370	53	− 5.8	—	− 4.9	− 4.5	− 10.1	− 5
1946	361	13.9	11,031	7.9	6.288	57	− 23.2	17.3	− 16.8	28.5	− 1.3	8
1947	427	21.2	19,560	9.6	8,998	46	18.3	51.9	90.0	21.0	43.1	− 19
1948	445	22.2	21,308	12.3	11,933	56	3.0	4.9	10.7	28.7	32.6	22
AVERAGE							*± 19.74*	*± 16.6*	*± 34.91*	*± 14.84*	*± 27.70*	*± 21*

[a] United Nations, *Economic Survey of Latin America, 1949* (New York, 1951), page 280.

[b] Output figures have been utilized in the absence of export data.

The conventional measure resulted in asymmetry in comparisons of the degree of rise with the degree of decline. While prices, quantities and proceeds could not fall by more than 100 per cent, they could rise without definite upper limit. Thus, if a very sharp rise occurred, the conventional measure of average fluctuation would be seriously distorted. Such wide fluctuations did, in fact, occur in the case of specific imports of subvarieties of primary commodities from particular exporting countries to the United States. With the revised measure used in this study, this difficulty is eliminated, since a rise as well as a drop has the identical upper limit of 100 per cent.[2] Without the revised measure, this difficulty would have to be overcome by the omission of figures for exceptional years or by the use of more complicated measurements based on logarithmic scales.

There is an important economic aspect in favour of the revised measure. This study, in accordance with the resolution of the Economic and Social Council from which it originated, deals with "fluctuations". While this term is neutral and may apply either to upward or to downward fluctuations, there is no doubt that the serious problem from the point of view of under-developed countries resides in downward fluctuations, that is, declines in prices.[3] It may be considered that the measure used in this study treats all fluctuations as declines, though not necessarily in chronological order. A fall in prices over a period — from year 0 to year 1 — is treated as a normal fall; hence the measure agrees with the conventional measure. A rise in prices from year 0 to year 1 is treated and measured as a shortfall in price in the previous year 0, relative to the higher terminal year 1. Thus, in a sense, a rise in prices is treated as a previous shortfall in price and measured as a reverse fall. This measure has also the advantage of treating the higher point reached in any comparison as the standard and of relating the measurements of other prices to this standard.

The revised measure has the advantage of simplicity, since it avoids complicated logarithmic scales or the relation of changes to hypothetical average figures. Furthermore, increases are easily converted into the conventional measure.[4]

A further drawback of the conventional measure is that average fluctuations obtained by this means depend largely on the sequence and timing of increases and decreases. Thus, if for commodity A the price (or volume or proceeds) falls from 10 to 5, and then gradually rises again from 5 to 6, from 6 to 7, and so back to 10, the average degree of fluctuation based on the conventional measure is considerably less than for commodity B, which first rises from 5 to 10 and then gradually drops from 10 to 9, from 9 to 8, and so back to 5. Yet the two commodities may be considered subject to exactly the same degree of fluctuation. The revised measure gives the same result for these two cases; the conventional measure does not.

Appendix C

Fluctuations in Retained Proceeds from Exports of Chilean Copper

In the case of under-developed countries, there is often an important distinction between the amount of foreign exchange earned by exporting commodities produced in the country and the amount retained within the country; fluctuations in the amount retained do not necessarily correspond, in degree or in direction, to the fluctuations in actual foreign exchange earnings. This distinction is vital, but trade statistics do not distinguish between foreign exchange earnings that are retained and those that are not.

Figures concerning retained receipts in the case of Chilean copper for which data were published in the *Economic Survey of Latin America, 1949*[5] are contained in the table opposite. Columns 7 to 12 of the table show average percentage fluctuation per year in copper output, in United States market prices per pound, and in total dollar export proceeds (retained or otherwise). In columns 10 and 11 are shown the fluctuations in foreign exchange retained, in terms of cents per pound, and total dollar proceeds, and the percentage which retained foreign exchange represents in relation to total foreign exchange earned.

The percentage of foreign exchange retained by Chile, in taxes and in other foreign exchange paid by

[2] The upper limit of 100 per cent applies to quantities which cannot have a negative value, such as prices, volume, proceeds and gross capital movements. Net capital inflow can be negative, however, if outflow exceeds inflow. In the part of chapter 6 which deals with capital movements, the measure used for fluctuation in net capital inflow can exceed 100 per cent. For instance, a fall from 100 to —50 is considered a decline of 150 per cent, and a rise from —50 to +100 is considered a rise of 150 per cent.

[3] Price increases are potentially beneficial, though they would be more useful if they were continuous and steady.

[4] Conversion can be accomplished simply by converting X into $\frac{100Y}{100-Y}$, where X is the percentage increase in prices on the conventional formula, and Y is the revised measure, which relates the increase to the higher terminal point reached. Conversely, the new measure, Y, equals $\frac{100X}{100+X}$. It is obvious that however large X is, Y can never be more than 100, and thus a rise on the new measure can never be more than 100 per cent, if parameters such as prices, volume and proceeds, which cannot become negative, are considered. No conversion is needed for declines.

[5] United Nations publication: 1951.II.G.1.

copper companies, as well as domestically incurred production costs, has increased fairly steadily during the period covered (1928 to 1948), from less than one-quarter in the nineteen-twenties to over one-half more recently. Furthermore, comparison of column 8 with column 10 and of column 9 with column 11 shows that year-to-year fluctuations in retained export proceeds, whether measured in price per pound of copper exported or in total dollar amounts retained, were less than in the total amount earned. Thus, fluctuations in retained exchange were 14.8 per cent on the average, measured in cents per pound, compared with an average fluctuation of 16.6 per cent in copper prices on the United States market; fluctuations in total retained earnings amounted to 27.7 per cent, compared with 34.9 per cent for total earnings.

The table shows significant differences between fluctuations in total proceeds retained and total earned from copper exports. Total retained earnings during three depression years (1929 to 1931) fell less than total earnings (*cf.* columns 9 and 11). Similarly, the decline from 1937 to 1938 in total earnings was almost wholly offset by an increase in the rate of retention; this also occurred between 1945 and 1946. Between 1944 and 1945, however, retained earnings fell more than total earnings.

Thus, on the whole, retained earnings were more stable than total earnings, though they varied more than either prices or quantities considered separately. In the absence of further study, it is not possible to say whether fluctuations in retained earnings are generally less than in total foreign exchange proceeds.

Appendix D

Supplementary Tables

Table I. Year-to-Year Fluctuations in Import Unit Values and Proceeds of Specific Items Exported to the United States

(Average percentage fluctuation per year)

Exporting country and commodity	Period covered (1)	Unit value		Proceeds		Ratio	
		1939[a] (2)	1949[b] (3)	1939[a] (4)	1949[b] (5)	Column (4) to column (2) (6)	Column (5) to column (3) (7)
Afghanistan:							
Fur, Persian lamb and caracul ..	1935 to 1949	...	14.7	...	68.6	...	4.7
Algeria:							
Iron ore	1922 to 1949	12.0	12.4	52.3	51.8	4.4	4.2
Anglo-Egyptian Sudan:							
Gum arabic	1922 to 1949	19.1	15.1	26.0	25.4	1.4	1.7
Angola:							
Coffee, raw	1932 to 1949	13.9	19.0	48.0	61.0	3.5	3.2
Argentina:							
Beef, canned	1934 to 1949	8.8	9.9	24.5	38.2	2.8	3.9
Bones, crude	1928 to 1949	10.3	14.3	30.4	30.3	3.0	2.1
Casein or lactarene	1922 to 1949	27.1	27.7	54.5	47.7	2.0	1.7
Cheese, Romano	1934 to 1949	8.1	13.0	59.3	61.7	7.3	4.7
Fur, lamb and sheep (not dressed)	1939 to 1949	...	23.6	...	59.7	...	2.5
Meat extract	1929 to 1949	14.2	16.7	52.8	51.8	3.7	3.1
Pears	1935 to 1949	11.5	16.3	58.3	53.3	5.1	3.3
Sausage casings	1927 to 1949	18.4	18.0	25.5	23.3	1.4	1.3
Tankage	1931 to 1949	19.2	21.2	50.6	48.3	2.6	2.3
Tanning extract, quebracho	1922 to 1949	13.3	12.0	20.8	22.8	1.6	1.9
Wool (greasy basis)	1930 to 1949	23.7	19.1	76.1	64.2	3.2	3.4
Wool, carpet (greasy basis)	1930 to 1949	20.3	23.8	49.5	57.3	2.4	2.8
Wool, worsted	1936 to 1949	...	14.1	...	56.0	...	4.0
Belgian Congo:							
Coffee	1938 to 1949	...	34.0	...	42.9	...	1.3
Oil, palm-kernel	1922 to 1949	13.2	15.3	24.0	25.5	1.8	1.7
Tin, bars, blocks, pigs	1933 to 1949	17.1	13.7	40.5	45.1	2.4	3.3
Bolivia:							
Antimony ore	1926 to 1949	22.5	19.4	60.5	53.7	2.7	2.8
Copper in concentrates	1936 to 1949	...	9.4	...	61.2	...	6.5
Lead ore	1936 to 1939	...	17.8	...	65.7	...	3.7
Tin ore	1922 to 1949	33.7	38.2	80.8	62.3	2.4	1.6
Brazil:							
Beef, canned	1934 to 1949	14.6	12.1	52.0	44.3	3.6	3.7
Brazil-nuts (shelled)	1930 to 1949	20.3	18.4	17.7	27.1	0.9	1.5
Brazil-nuts (unshelled)	1930 to 1949	27.0	25.7	19.3	30.8	0.7	1.2
Cocoa or cocoa beans	1922 to 1949	20.4	21.4	23.0	27.2	1.1	1.3
Coffee	1922 to 1949	15.8	15.3	11.7	15.5	0.7	1.0
Iron ore	1923 to 1949	36.6	27.5	59.7	56.7	1.6	2.1
Manganese ore	1934 to 1949	7.0	8.0	52.4	37.6	7.5	4.7
Oil, oiticica	1936 to 1949	12.0	16.7	35.0	42.1	2.9	2.5
Oil-seeds, Babassu	1936 to 1949	27.1	17.8	66.4	51.7	2.5	2.9
Oil-seeds, castor beans	1922 to 1949	17.8	18.8	42.2	34.4	2.4	1.8
Oil-seeds, Tucum	1939 to 1949	...	24.3	...	44.9	...	1.8
Skins, goat and kid	1922 to 1949	18.4	19.5	23.8	23.2	1.3	1.2
Skins, hair sheep and cabretta ..	1942 to 1949	...	23.1	...	34.0	...	1.5
Tapioca	1937 to 1949	...	16.2	...	57.3	...	3.5
Vegetable wax, Carnauba	1927 to 1949	18.3	18.1	18.4	20.9	1.0	1.2

Table I (*continued*)

Exporting country and commodity	Period covered (1)	Unit value		Proceeds		Ratio	
		1939[a] (2)	1949[b] (3)	1939[a] (4)	1949[b] (5)	Column (4) to column (2) (6)	Column (5) to column (3) (7)
British East Africa:							
Pyrethrum	1935 to 1949	29.1	16.9	45.7	56.9	1.6	3.4
Sisal and henequen	1922 to 1949	17.8	16.7	40.9	42.5	2.3	2.5
Skins, goat and kid	1922 to 1949	17.7	16.9	34.3	35.9	1.9	2.1
British Honduras:							
Logs, mahogany	1922 to 1949	5.8	6.6	50.8	39.9	8.8	6.0
Bulgaria:							
Tobacco, cigarette leaf	1923 to 1949	18.7	13.3	58.1	60.5	3.1	4.5
Canal Zone:							
Bananas	1938 to 1949	...	19.7	...	41.8	...	2.1
Ceylon:							
Rubber, crude	1934 to 1949	26.1	23.3	33.3	32.6	1.3	1.4
Tea	1922 to 1949	10.7	10.3	13.4	17.5	1.3	1.7
Chile:							
Copper in concentrates	1922 to 1949	11.1	13.5	66.5	56.0	5.8	4.1
Copper, refined	1922 to 1949	17.9	14.7	40.9	33.3	2.3	2.3
Iron ore	1922 to 1949	12.8	14.9	45.8	36.4	3.6	2.4
Lead ore	1936 to 1949	...	23.9	...	54.2	...	2.3
China:							
Bristles, sorted and bunched	1922 to 1949	13.0	17.4	23.7	22.2	1.8	1.3
Egg yolk, dried	1929 to 1949	20.5	19.6	35.8	42.2	1.8	2.2
Feathers	1934 to 1949	25.1	19.6	51.1	42.3	2.0	2.2
Feathers, bed	1929 to 1949	18.2	24.8	47.3	41.2	2.6	1.7
Fur, weasel (not dressed)	1928 to 1949	22.6	22.6	35.2	40.2	1.6	1.8
Oil, tung	1922 to 1949	18.9	18.2	26.7	31.1	1.4	1.7
Skins, goat and kid	1923 to 1949	17.8	18.5	33.8	35.3	1.9	1.9
Tea	1922 to 1949	12.3	19.2	22.5	25.9	1.8	1.3
Tin, bars, blocks, pigs	1922 to 1949	19.4	16.6	66.6	58.2	3.4	3.5
Wool, carpet (greasy basis)	1930 to 1949	22.4	19.9	57.8	55.2	2.6	2.8
Wool, carpet (washed)	1934 to 1949	26.0	20.1	69.2	66.3	2.7	3.3
Colombia:							
Bananas	1922 to 1949	5.4	5.7	18.9	23.4	3.5	4.1
Coffee	1922 to 1949	9.4	11.4	12.1	13.0	1.3	1.1
Petroleum, crude	1926 to 1949	19.5	16.8	34.7	32.3	1.8	1.9
Platinum	1937 to 1949	14.3	13.7	31.2	24.2	2.2	1.8
Costa Rica:							
Bananas	1922 to 1949	5.2	5.6	17.2	21.4	3.3	3.8
Cocoa or cocoa beans	1922 to 1949	17.4	17.3	39.4	37.7	2.3	2.2
Coffee	1922 to 1949	10.9	11.5	31.8	34.4	2.9	3.0
Fibre, manila	1944 to 1949	...	14.9	...	53.1	...	3.6
Cuba:							
Bananas	1922 to 1949	6.9	8.4	22.2	24.6	3.2	2.9
Copper in concentrates	1922 to 1949	15.7	12.8	34.7	29.0	2.2	2.3
Manganese ore	1937 to 1949	...	10.1	...	38.6	...	3.8
Molasses, not for human consumption	1934 to 1949	18.2	22.5	33.0	41.6	1.8	1.8
Pineapples, crated	1934 to 1949	0.8	6.1	16.8	24.7	21.0	4.0
Pineapples, prepared	1924 to 1949	24.0	18.9	45.2	41.1	1.9	2.2
Sisal and henequen	1922 to 1949	17.5	18.8	40.6	44.4	2.3	2.4
Sugar, cane (96°)	1922 to 1949	21.5	17.5	20.1	24.3	0.9	1.4
Sugar, cane (97°)	1936 to 1949	11.5	12.6	15.5	29.1	1.3	2.3
Sugar, cane (100°)	1934 to 1949	16.2	13.4	10.3	11.6	0.6	0.9
Tobacco filler, stemmed	1922 to 1949	6.5	8.0	14.5	16.1	2.2	2.0
Tobacco filler, unstemmed	1922 to 1949	7.6	10.5	13.5	17.4	1.8	1.7
Tobacco scrap	1922 to 1949	8.5	10.9	11.1	16.4	1.3	1.5
Tobacco wrapper	1922 to 1949	11.1	11.5	18.6	20.4	1.7	1.8
Tomatoes	1924 to 1949	8.3	10.2	19.8	24.5	2.4	2.4

Table I (*continued*)

Exporting country and commodity	Period covered (1)	Unit value		Proceeds		Ratio	
		1939[a] (2)	1949[b] (3)	1939[a] (4)	1949[b] (5)	Column (4) to column (2) (6)	Column (5) to column (3) (7)
Dominican Republic:							
Bananas	1922 to 1949	20.3	15.2	68.2	51.2	3.4	3.4
Chocolate	1943 to 1949	...	38.3	...	49.8	...	1.3
Cocoa or cocoa beans	1922 to 1949	20.5	22.5	23.4	26.6	1.1	1.2
Coffee, raw	1922 to 1949	12.6	13.9	29.1	29.7	2.3	2.1
Coffee, roasted	1936 to 1949	...	13.1	...	44.2	...	3.4
Corn	1922 to 1949	16.1	18.1	33.7	35.2	2.1	1.9
Molasses, not for human consumption	1934 to 1949	16.8	24.0	18.8	30.2	1.1	1.3
Sugar, cane (96°)	1934 to 1949	23.6	21.7	63.0	57.5	2.7	2.6
Ecuador:							
Bananas	1932 to 1949	13.6	13.3	39.3	42.6	2.9	3.2
Cocoa or cocoa beans	1922 to 1949	14.6	16.6	25.7	25.4	1.8	1.5
Coffee	1922 to 1949	16.6	17.6	59.9	49.9	3.6	2.8
Egypt:							
Cotton, raw (long staple)	1922 to 1949	15.3	15.2	33.3	35.0	2.2	2.3
El Salvador:							
Coffee	1922 to 1949	21.8	19.4	32.3	26.2	1.5	1.4
Ethiopia:							
Skins, goat and kid	1929 to 1949	24.5	22.6	55.5	48.9	2.3	2.2
French Oceania:							
Chrome ore	1922 to 1949	34.7	27.7	48.4	46.2	1.4	1.7
French West Africa:							
Cocoa or cocoa beans	1926 to 1949	26.1	27.8	48.5	49.3	1.9	1.8
Gold Coast:							
Cocoa or cocoa beans	1930 to 1949	26.3	23.1	35.5	38.0	1.3	1.6
Logs, mahogany	1922 to 1949	17.9	15.7	39.1	36.7	2.2	2.3
Manganese ore	1934 to 1949	21.2	17.9	39.8	34.4	1.9	1.9
Manganese ore (battery grade)	1940 to 1949	...	21.4	...	21.2	...	1.0
Greece:							
Sponges	1922 to 1949	42.8	40.8	26.9	28.3	0.6	0.7
Tobacco, cigarette leaf	1922 to 1949	15.7	14.5	28.1	35.2	1.8	2.4
Greenland:							
Cryolite	1924 to 1949	6.0	7.6	23.9	36.0	4.0	4.7
Guatemala:							
Bananas	1922 to 1949	7.8	7.0	16.9	21.0	2.2	3.0
Chicle, crude	1935 to 1949	22.1	17.0	39.1	32.4	1.8	1.9
Coffee	1922 to 1949	12.1	13.3	23.1	20.1	1.9	1.5
Fibre, manila	1944 to 1949	...	13.9	...	40.3	...	2.9
Haiti:							
Bananas	1930 to 1949	14.0	12.5	50.0	42.6	3.6	3.4
Coffee	1922 to 1949	15.3	15.6	52.1	43.6	3.4	2.8
Sisal and henequen	1927 to 1949	16.4	15.4	35.9	32.2	2.2	2.1
Honduras:							
Bananas	1922 to 1949	5.5	7.0	15.1	17.3	2.7	2.5
Coffee	1922 to 1949	17.4	17.7	42.8	36.9	2.5	2.1
Fibre, manila	1944 to 1949	...	14.4	...	34.8	...	2.4
India:							
Cotton, raw (short staple)	1922 to 1949	12.4	13.8	30.8	29.4	2.5	2.1
Gum, kadaya	1929 to 1949	16.6	14.4	29.6	24.9	1.8	1.7
Jute bagging	1934 to 1949	11.2	18.5	15.3	34.3	1.4	1.9
Jute burlaps	1922 to 1949	13.4	18.8	19.3	19.8	1.4	1.1
Jute, not manufactured	1922 to 1949	15.1	15.8	28.2	28.5	1.9	1.8
Lac, crude, seed	1930 to 1949	23.9	22.6	28.5	29.3	1.2	1.3
Leather, goat, rough-tanned	1934 to 1949	15.2	14.6	40.4	36.9	2.7	2.5

Table I (*continued*)

Exporting country and commodity	Period covered (1)	Unit value		Proceeds		Ratio	
		1939[a] (2)	1949[b] (3)	1939[a] (4)	1949[b] (5)	Column (4) to column (2) (6)	Column (5) to column (3) (7)
India (continued):							
Leather, upper, reptilian and sharkskin	1931 to 1949	...	31.4	...	49.7	...	1.6
Manganese ore	1934 to 1949	8.0	13.0	60.6	47.5	7.6	3.7
Mica, manufactured, splittings	1934 to 1949	9.4	17.2	45.6	42.5	4.9	2.5
Nuts, cashew	1930 to 1949	11.1	12.1	21.6	18.6	1.9	1.5
Pepper, black	1922 to 1949	23.9	27.4	53.2	52.8	2.2	1.9
Psyllium seed	1933 to 1949	22.4	22.3	45.5	43.9	2.0	2.0
Shellac, unbleached	1933 to 1949	19.6	23.6	36.3	33.2	1.9	1.4
Skins, goat and kid	1922 to 1949	15.9	17.5	24.2	25.5	1.5	1.5
Tea	1922 to 1949	15.1	13.5	16.7	15.8	1.1	1.2
Wool, carpet (washed)	1934 to 1949	15.5	15.7	66.2	57.3	4.2	3.6
Indonesia:							
Copra	1922 to 1949	23.6	26.0	59.0	58.0	2.5	2.2
Oil, palm-kernel	1922 to 1949	17.6	19.2	29.6	36.6	1.7	1.9
Pepper, black	1922 to 1949	21.4	20.7	29.1	31.0	1.4	1.5
Pepper, white	1922 to 1949	24.4	22.0	29.1	29.2	1.2	1.3
Rubber, crude	1934 to 1949	25.5	22.0	38.7	38.2	1.5	1.7
Tea	1922 to 1949	16.9	17.1	21.3	24.5	1.3	1.4
Tobacco wrapper	1932 to 1949	...	17.2	...	23.3	...	1.4
Iran:							
Gum, tragacanth	1922 to 1949	22.1	20.3	44.3	41.7	2.0	2.1
Nuts, pistachio (unshelled)	1924 to 1949	13.9	11.9	47.4	59.9	3.4	5.0
Rugs, woollen	1930 to 1949	20.4	17.4	30.5	28.3	1.5	1.6
Iraq:							
Dates	1934 to 1949	9.9	12.2	15.3	15.9	1.5	1.3
Wool, carpet (washed)	1936 to 1949	...	14.9	...	78.7	...	5.3
Liberia:							
Rubber, crude	1934 to 1949	28.9	19.7	35.2	30.5	1.2	1.5
Rubber, milk or latex	1934 to 1949	13.6	9.5	48.8	36.4	3.6	3.8
Madagascar:							
Vanilla beans	1922 to 1949	32.3	26.4	44.4	41.8	1.4	1.6
Malaya:							
Rubber, crude	1934 to 1949	27.4	23.9	33.5	36.1	1.2	1.5
Rubber, milk or latex	1934 to 1949	14.2	12.4	58.0	50.0	4.0	4.0
Tin, bars, blocks, pigs	1922 to 1949	21.3	18.9	27.6	31.9	1.3	1.7
Mexico:							
Abalone	1943 to 1949	...	15.5	...	26.6	...	1.7
Bananas	1922 to 1949	7.4	8.9	14.3	19.3	1.9	2.2
Chicle, crude	1923 to 1949	8.7	10.1	25.9	27.6	3.0	2.7
Coffee	1922 to 1949	11.2	13.1	30.3	27.5	2.7	2.1
Copper in concentrates	1936 to 1949	16.5	13.6	33.1	38.3	2.0	2.8
Cotton, raw (short staple)	1922 to 1949	19.9	17.8	58.1	56.5	2.9	3.2
Fibre, istle or tampico	1922 to 1949	16.3	14.2	27.9	29.5	1.7	2.1
Fish liver	1937 to 1949	20.0	24.7	91.1	52.3	4.6	2.1
Lead, bars and pigs	1938 to 1949	...	17.1	...	47.3	...	2.8
Lead ore	1936 to 1949	...	15.7	...	57.2	...	3.6
Manganese ore	1936 to 1949	...	25.2	...	44.6	...	1.8
Molasses, not for human consumption	1936 to 1949	...	31.6	...	59.0	...	1.9
Oilcake, cotton-seed	1928 to 1949	16.3	16.9	48.9	48.5	3.1	2.9
Petroleum, crude	1922 to 1949	14.4	15.0	28.3	35.9	2.0	2.4
Pineapples, preserved	1942 to 1949	...	12.6	...	45.6	...	3.6
Shrimps and prawns	1934 to 1949	15.3	16.1	52.3	41.3	3.4	2.6
Sisal and henequen	1922 to 1949	16.5	16.4	26.1	25.8	1.6	2.6
Softwood, pine	1935 to 1949	...	13.4	...	35.8	...	2.7
Tomatoes	1924 to 1949	2.1	5.8	33.8	31.7	16.1	5.5
Vanilla beans	1922 to 1949	14.4	18.1	29.8	32.6	2.1	1.8
Vegetable wax, candelilla	1936 to 1949	6.6	16.5	47.1	43.3	7.1	2.6

Table I (*continued*)

Exporting country and commodity	Period covered (1)	Unit value		Proceeds		Ratio	
		1939[a] (2)	1949[b] (3)	1939[a] (4)	1949[b] (5)	Column (4) to column (2) (6)	Column (5) to column (3) (7)
Mexico (continued):							
Zinc, blocks	1933 to 1949	21.4	19.6	56.5	44.2	2.6	2.3
Zinc ore	1935 to 1949	...	15.9	...	44.1	...	2.8
Mozambique:							
Sisal and henequen	1923 to 1949	17.4	16.2	59.7	50.0	3.4	3.1
Netherlands Antilles:							
Fuel oil, for ship supplies	1939 to 1949	...	14.1	...	45.4	...	3.2
Fuel oil, residual	1939 to 1949	...	20.3	...	32.6	...	1.6
Newfoundland:							
Copper in concentrates	1938 to 1949	...	29.4	...	46.5	...	1.6
Lead ore	1936 to 1949	...	24.9	...	36.4	...	1.5
Zinc ore	1940 to 1949	...	17.0	...	47.0	...	2.8
Nicaragua:							
Coffee	1922 to 1949	14.0	13.9	43.5	36.5	3.1	2.6
Nigeria:							
Cocoa or cocoa beans	1930 to 1949	30.2	25.7	40.2	37.5	1.3	1.5
Skins, goat or kid	1922 to 1949	20.1	16.6	55.2	42.7	2.7	2.6
Panama:							
Bananas	1922 to 1949	7.9	7.9	9.5	19.8	1.2	2.5
Cocoa or cocoa beans	1922 to 1949	8.0	12.7	27.0	35.1	3.4	2.8
Fibre, manila	1940 to 1949	...	12.0	...	61.0	...	5.1
Paraguay:							
Tanning extract, quebracho	1922 to 1949	14.7	13.7	48.9	40.9	3.3	3.3
Peru:							
Copper in concentrates	1922 to 1949	18.9	15.1	52.9	52.2	2.8	3.5
Copper, refined	1934 to 1949	...	13.9	...	61.2	...	4.4
Cotton, raw (long staple)	1935 to 1949	...	21.9	...	43.2	...	2.0
Lead, bars and pigs	1936 to 1949	...	21.2	...	48.1	...	2.3
Lead ore	1936 to 1949	...	12.0	...	52.8	...	4.4
Sugar, cane (96°)	1934 to 1949	22.2	26.0	53.6	42.9	2.4	1.7
Philippines:							
Coconut meat	1922 to 1949	11.1	10.9	24.7	32.0	2.2	2.9
Copra	1922 to 1949	20.2	24.6	27.5	30.9	1.4	1.3
Fibre, manila	1922 to 1949	21.3	21.1	29.6	28.9	1.4	1.4
Oil, coconut	1922 to 1949	17.4	18.8	22.3	25.0	1.3	1.3
Oilcake, copra	1922 to 1949	23.2	32.7	47.0	48.0	2.0	1.5
Pineapples, preserved	1931 to 1949	20.7	21.0	48.2	47.3	2.3	2.3
Sugar, cane (96°)	1937 to 1949	...	12.7	...	23.2	...	1.8
Portugal:							
Sardines, in oil	1931 to 1949	...	13.5	...	30.4	...	2.3
Southern Rhodesia:							
Chrome ore	1934 to 1949	9.8	10.4	47.3	40.3	4.8	3.9
Surinam:							
Bauxite, crude	1923 to 1949	8.1	6.2	25.5	27.3	3.5	4.4
Syria:							
Tobacco, cigarette leaf	1926 to 1949	23.3	16.9	45.8	44.1	2.0	2.6
Wool, carpet (washed)	1936 to 1949	21.7	26.4	52.4	55.6	2.4	2.1
Trinidad and Tobago:							
Cocoa or cocoa beans	1922 to 1949	20.7	19.4	23.4	28.0	1.1	1.4
Fuel oil, residual	1939 to 1949	...	24.8	...	51.4	...	2.1
Turkey:							
Nuts, filbert (shelled)	1922 to 1949	20.6	20.6	40.4	42.3	2.0	2.1
Opium	1922 to 1949	19.8	18.2	36.4	36.6	1.8	2.0
Tobacco, cigarette leaf	1922 to 1949	11.0	11.1	38.1	39.6	3.5	3.6

Table I (*continued*)

Exporting country and commodity	Period covered (1)	Unit value 1939[a] (2)	Unit value 1949[b] (3)	Proceeds 1939[a] (4)	Proceeds 1949[b] (5)	Ratio Column (4) to column (2) (6)	Ratio Column (5) to column (3) (7)
Uruguay:							
Beef, canned	1934 to 1949	10.0	7.9	23.3	43.8	2.3	5.5
Wool, combing (greasy basis)	1936 to 1949	18.7	14.2	76.9	50.3	4.1	3.5
Venezuela:							
Cocoa or cocoa beans	1922 to 1949	15.3	16.7	29.8	27.9	1.9	1.7
Coffee	1922 to 1949	13.2	14.1	21.3	24.2	1.6	1.7
Fuel oil, residual	1940 to 1949	...	24.6	...	76.3	...	3.1
Petroleum, crude	1922 to 1949	10.3	10.8	27.6	32.1	2.7	3.0
AVERAGE		*±16.8*	*±17.3*	*±37.4*	*±38.7*	*2.2*	*2.2*

Source: See appendix A.

[a] Period beginning as indicated in column 1 and ending in 1939; 175 items.

[b] Period beginning as indicated in column 1 and ending in 1949; 218 items.

Table II. Year-to-Year Fluctuations in Import Unit Values and Proceeds of Specific Items Exported to the United States during Years of Falling Prices

(Average percentage fluctuation per year)

Exporting country and commodity*	Years of falling unit values (Number)	Decrease in unit value (Percentage)	Variation in proceeds (Percentage)	Decrease in proceeds: More than in unit value (Number of years)	Decrease in proceeds: Less than in unit value (Number of years)	Increase in proceeds (Number of years)
Algeria:						
Iron ore	7	15.2	− 26.9	5	—	2
Anglo-Egyptian Sudan:						
Gum arabic	14	14.4	− 5.9	6	2	6
Angola:						
Coffee, raw	8	14.7	− 19.3	5	—	3
Argentina:						
Bones, crude	10	11.3	− 10.3	4	3	3
Casein or lactarene	11	33.5	− 25.1	7	1	3
Cheese, Romano	5	10.8	10.1	2	—	3
Meat extract	11	17.3	21.2	3	1	7
Pears	5	15.9	50.8	1	—	4
Sausage casings	12	13.7	− 6.8	6	—	6
Tankage	7	14.7	− 4.0	3	—	4
Tanning extract, quebracho	6	16.6	− 22.9	3	1	2
Wool (greasy basis)	7	17.8	1.0	3	—	4
Wool, carpet (greasy basis)	7	26.8	− 27.5	5	—	2
Belgian Congo:						
Oil, palm-kernel	12	15.2	− 9.0	5	3	4
Bolivia:						
Antimony ore	8	18.6	5.0	4	0	4
Copper in concentrates	5	4.6	4.6	2	—	3
Tin ore	9	32.4	− 37.0	6	1	2
Brazil:						
Brazil-nuts (shelled)	8	21.0	− 13.8	3	3	2
Brazil-nuts (unshelled)	10	21.3	− 14.4	4	4	2
Cocoa or cocoa beans	10	19.1	− 12.9	2	6	2
Coffee	11	15.7	− 9.6	3	7	1
Iron ore	8	22.2	14.3	2	—	6
Manganese ore	7	3.5	− 24.1	5	—	2
Oil, oiticica	6	15.9	23.7	1	—	5
Oil-seeds, Babassu	7	15.5	29.7	6	—	1
Oil-seeds, castor beans	14	16.4	7.1	4	4	6
Skins, goat and kid	12	16.8	− 16.7	7	2	3
Vegetable wax, Carnauba	8	16.5	− 8.4	2	3	3
British East Africa:						
Sisal and henequen	11	16.1	− 18.0	7	—	4
Skins, goat and kid	10	19.2	− 22.6	5	3	2
British Honduras:						
Logs, mahogany	10	4.4	− 25.0	7	1	2
Bulgaria:						
Tobacco, cigarette leaf	6	10.8	− 35.5	4	0	2
Ceylon:						
Rubber, crude	8	30.4	− 39.0	5	2	1
Tea	10	10.6	− 1.1	4	2	4
Chile:						
Copper in concentrates	8	18.3	27.3	3	—	5
Copper, refined	11	16.1	− 27.3	6	1	4
Iron ore	10	16.1	− 17.6	5	1	4

Table II (*continued*)

Exporting country and commodity[a]	Years of falling unit values (Number)	Decrease in unit value (Percentage)	Variation in proceeds	Decrease in proceeds: More than in unit value (Number of years)	Decrease in proceeds: Less than in unit value (Number of years)	Increase in proceeds
China:						
Bristles, sorted and bunched	8	17.9	−17.6	5	2	1
Egg yolk, dried	6	26.8	4.8	3	—	3
Feathers, bed	8	20.5	−26.7	6	—	2
Fur, weasel (not dressed)	7	28.3	−35.2	5	2	—
Oil, tung	13	14.8	−25.6	9	—	4
Skins, goat and kid	9	25.2	−25.1	4	3	2
Tea	13	14.0	−9.5	7	3	3
Tin, bars, blocks, pigs	7	18.6	11.4	3	—	4
Wool, carpet (greasy basis)	7	17.7	−14.2	3	—	4
Colombia:						
Bananas	11	4.4	−11.3	7	—	4
Coffee	10	12.3	−3.9	2	5	3
Petroleum, crude	10	15.4	21.1	2	1	7
Platinum	15	14.2	−9.3	8	3	4
Costa Rica:						
Bananas	10	6.3	0.4	4	2	4
Cocoa or cocoa beans	7	26.6	−25.9	2	3	2
Coffee	11	8.4	6.1	3	1	7
Cuba:						
Bananas	14	7.3	−11.0	7	1	6
Copper in concentrates	13	13.2	−21.3	9	1	3
Manganese ore	5	9.2	−21.4	3	—	2
Molasses, not for human consumption	7	29.2	−31.6	3	2	2
Pineapples, crated	5	2.5	0.2	2	—	3
Pineapples, prepared	11	13.7	−7.7	5	—	6
Sisal and henequen	11	19.8	−17.0	6	—	5
Sugar, cane (96°)	12	17.1	−23.3	6	4	2
Sugar, cane (97°)	5	9.7	1.2	2	—	3
Sugar, cane (100°)	5	7.5	−8.0	2	1	2
Tobacco filler, stemmed	12	6.8	−3.2	4	3	5
Tobacco filler, unstemmed	14	9.5	−4.5	8	2	4
Tobacco scrap	14	7.0	−5.0	6	1	7
Tobacco wrapper	12	8.8	25.8	3	—	9
Tomatoes	13	10.3	−6.9	5	2	6
Dominican Republic:						
Bananas	7	20.2	16.0	3	—	4
Cocoa or cocoa beans	14	20.5	−13.8	6	3	5
Coffee, raw	12	13.3	9.5	5	2	5
Corn	12	18.4	−20.0	7	2	3
Molasses, not for human consumption	7	30.5	12.9	2	3	2
Sugar, cane (96°)	9	22.8	−16.7	5	1	3
Ecuador:						
Bananas	6	15.5	12.0	2	—	4
Cocoa or cocoa beans	14	14.8	−17.1	6	5	3
Coffee	12	17.3	−4.1	5	—	7
Egypt:						
Cotton, raw (long staple)	8	21.3	−25.6	4	2	2
El Salvador:						
Coffee	12	19.5	−3.7	2	4	6
Ethiopia:						
Skins, goat and kid	5	27.9	−27.6	3	—	2
French Oceania:						
Chrome ore	9	29.8	−4.0	6	2	1
French West Africa:						
Cocoa or cocoa beans	6	36.3	−11.7	3	1	2

Table II (*continued*)

Exporting country and commodity[a]	*Years of falling unit values* (Number)	*Decrease in unit value* (Percentage)	*Variation in proceeds* (Percentage)	*Decrease in proceeds*		*Increase in proceeds* (Number of years)
				More than in unit value (Number of years)	*Less than in unit value* (Number of years)	
Gold Coast:						
Cocoa or cocoa beans	6	30.3	−15.2	3	1	2
Logs, mahogany	11	15.8	−16.9	6	1	4
Manganese ore	7	15.4	6.3	2	3	2
Greece:						
Sponges	8	39.2	17.3	1	2	5
Tobacco, cigarette leaf	10	13.8	−17.7	7	—	3
Greenland:						
Cryolite	10	8.4	13.6	3	2	5
Guatemala:						
Bananas	9	4.4	−6.7	6	—	3
Chicle, crude	6	16.6	−26.2	4	2	0
Coffee	13	11.4	−5.6	4	3	6
Haiti:						
Bananas	9	10.5	13.7	2	—	7
Coffee	11	17.1	9.6	5	—	6
Sisal and henequen	10	14.6	22.3	2	2	6
Honduras:						
Bananas	9	5.7	7.8	3	—	6
Coffee	12	15.0	2.3	5	1	6
India:						
Cotton, raw (short staple)	8	18.4	−32.8	5	2	1
Gum, kadaya	8	14.5	−9.7	5	—	3
Jute burlaps	11	16.7	−11.5	5	2	4
Jute, not manufactured	8	16.6	−29.4	5	2	1
Lac, crude, seed	9	18.9	−6.8	4	1	4
Manganese ore	5	12.6	−12.0	2	2	1
Mica, manufactured, splittings	5	4.5	15.4	—	3	2
Nuts, cashew	7	16.4	−7.7	2	2	3
Pepper, black	8	26.0	−16.5	3	2	3
Shellac, unbleached	8	16.6	1.3	4	—	4
Skins, goat and kid	9	26.0	−23.6	5	2	2
Tea	13	9.6	9.2	1	4	8
Wool, carpet (washed)	5	17.8	11.0	2	1	2
Indonesia:						
Copra	11	24.1	11.4	4	—	7
Oil, palm-kernel	6	20.7	−18.0	2	2	2
Pepper, black	7	26.3	−3.9	1	3	3
Pepper, white	8	24.6	−2.4	2	2	4
Rubber, crude	7	25.6	−14.9	3	2	2
Tea	7	19.3	−14.9	4	1	2
Iran:						
Gum, tragacanth	11	17.7	−3.9	6	—	5
Nuts, pistachio (unshelled)	7	12.3	−8.0	3	—	4
Rugs, woollen	8	17.7	−4.9	4	1	3
Iraq:						
Dates	9	10.8	−8.0	5	2	2
Liberia:						
Rubber, crude	11	18.7	−18.4	5	3	3
Rubber, milk or latex	8	10.3	12.3	3	2	3
Madagascar:						
Vanilla beans	8	17.3	24.9	2	—	6
Malaya:						
Rubber, crude	8	24.1	−38.7	5	2	1
Tin, bars, blocks, pigs	9	18.8	−12.7	4	1	4

Table II (*continued*)

Exporting country and commodity[a]	Years of falling unit values (Number)	Decrease in unit value (Percentage)	Variation in proceeds (Percentage)	Decrease in proceeds: More than in unit value (Number of years)	Decrease in proceeds: Less than in unit value (Number of years)	Increase in proceeds (Number of years)
Mexico:						
Bananas	10	6.7	−0.9	6	—	4
Chicle, crude	11	9.9	−16.5	8	—	3
Coffee	12	12.1	1.8	6	—	6
Copper in concentrates	12	12.0	−6.3	7	—	5
Cotton, raw (short staple)	12	18.3	−25.9	7	1	4
Fibre, istle or tampico	12	12.4	−16.1	9	1	2
Oilcake, cotton-seed	8	18.6	−14.0	5	—	3
Petroleum, crude	13	11.5	−30.4	9	3	1
Sisal and henequen	9	20.2	−14.9	3	4	2
Softwood, pine	5	3.7	10.0	2	—	3
Tomatoes	7	4.1	0.6	3	—	4
Vanilla beans	12	20.6	−11.3	7	—	5
Zinc, blocks	6	23.4	24.8	1	—	5
Mozambique:						
Sisal and henequen	8	22.1	6.2	3	—	5
Nicaragua:						
Coffee	12	12.4	−1.3	4	1	7
Nigeria:						
Cocoa or cocoa beans	7	29.2	−6.1	2	2	3
Skins, goat and kid	9	19.4	−24.2	6	2	1
Panama:						
Bananas	12	5.3	−3.0	4	3	5
Cocoa or cocoa beans	12	10.4	−17.3	6	2	4
Paraguay:						
Tanning extract, quebracho	5	18.9	−9.1	2	1	2
Peru:						
Copper in concentrates	9	16.9	7.1	3	—	6
Lead, bars and pigs	6	15.8	28.2	1	—	5
Sugar, cane (96°)	10	26.1	−11.8	6	1	3
Philippines:						
Coconut meat	7	16.8	−15.8	3	2	2
Copra	12	21.5	−18.2	6	3	3
Fibre, manila	10	19.9	−25.0	6	—	4
Oil, coconut	10	22.4	−16.8	4	3	3
Oilcake, copra	10	23.5	−19.8	6	—	4
Portugal:						
Sardines, in oil	5	11.6	19.1	1	—	4
Surinam:						
Bauxite, crude	13	3.4	5.8	5	—	8
Syria:						
Tobacco, cigarette leaf	6	22.2	19.2	1	—	5
Trinidad and Tobago:						
Cocoa or cocoa beans	10	20.0	−12.7	3	2	5
Turkey:						
Nuts, filbert (shelled)	10	19.8	0.2	5	1	4
Opium	14	14.2	−11.9	7	3	4
Tobacco, cigarette leaf	12	11.5	−1.8	6	—	6
Venezuela:						
Cocoa or cocoa beans	11	17.1	−5.9	5	1	5
Coffee	9	17.6	−13.1	5	1	3
Petroleum, crude	9	10.5	2.2	5	—	4
AVERAGE, 162 ITEMS		*−16.5*	*−8.3*			

Source: See appendix A; for periods covered, see table I in appendix D.

[a] The number of items was limited by the exclusion of those for which at least five years of falling prices could not be computed and for which corresponding data for variations in proceeds were not available. Countries whose export trade was vitally affected by the Second World War were also omitted from the calculations. Thus the number of items (162) is smaller than the 218 listed in table I in appendix D.

Table III. Year-to-Year Fluctuations in Import Unit Values and Proceeds of Specific Items Exported to the United States during Years of Falling Receipts

(Average percentage fluctuation per year)

Exporting country and commodity[a]	Years of falling proceeds (Number)	Decrease in proceeds (Percentage)	Variation in unit value (Percentage)	Falling unit value and volume (Number of years)	Falling unit value alone (Number of years)	Falling volume alone (Number of years)
Algeria:						
Iron ore	9	60.2	0.3	5	—	4
Anglo-Egyptian Sudan:						
Gum arabic	11	26.6	−11.7	6	2	3
Angola:						
Coffee, raw	6	65.0	−11.5	5	—	1
Argentina:						
Beef, canned	6	30.6	8.1	—	1	5
Bones, crude	9	29.3	−7.3	6	1	2
Casein or lactarene	13	47.8	−14.3	7	1	5
Cheese, Romano	8	59.3	11.5	2	—	6
Meat extract	11	47.9	3.4	3	1	7
Sausage casings	9	28.3	−7.1	6	—	3
Tankage	7	50.4	0.5	3	—	4
Tanning extract, quebracho	9	29.8	−8.2	2	2	5
Wool (greasy basis)	6	69.4	1.9	3	—	3
Wool, carpet (greasy basis)	10	59.7	−3.1	5	—	5
Wool, worsted	6	49.0	3.0	2	—	4
Belgian Congo:						
Coffee	5	39.6	0.2	1	1	3
Oil, palm-kernel	11	23.3	−14.4	5	3	3
Tin, bars, blocks, pigs	7	47.9	5.6	3	—	4
Bolivia:						
Antimony ore	7	61.4	5.4	4	—	3
Copper in concentrates	5	61.6	7.4	2	—	3
Tin ore	8	59.9	−24.5	6	1	1
Brazil:						
Beef, canned	5	43.3	6.7	1	—	4
Brazil-nuts (shelled)	7	25.1	−12.7	3	3	1
Brazil-nuts (unshelled)	10	30.4	−16.0	4	4	2
Cocoa or cocoa beans	13	19.5	−9.3	4	6	3
Coffee	12	14.5	−9.4	5	5	2
Manganese ore	6	38.8	2.8	5	—	1
Oil-seeds, Babassu	10	38.9	−2.6	6	—	4
Oil-seeds, castor beans	12	28.4	−5.3	4	4	4
Skins, goat and kid	12	24.4	−10.6	7	2	3
Tapioca	5	49.2	2.0	1	—	4
Vegetable wax, Carnauba	9	18.3	−5.9	3	2	4
British East Africa:						
Sisal and henequen	12	39.7	−3.7	7	—	5
Skins, goat and kid	12	37.9	−8.0	5	3	4
British Honduras:						
Logs, mahogany	12	41.1	0.6	7	1	4
Bulgaria:						
Tobacco, cigarette leaf	5	32.3	−6.0	4	—	1
Ceylon:						
Rubber, crude	8	35.9	−31.5	6	1	1
Tea	8	17.4	−8.4	4	3	1
Chile:						
Copper in concentrates	11	48.7	7.4	3	—	8
Copper, refined	15	30.9	−3.3	6	1	8
Iron ore	8	46.4	−15.5	5	1	2
Lead ore	6	45.9	18.0	1	—	5

Table III (*continued*)

Exporting country and commodity[a]	Years of falling proceeds (Number)	Decrease in proceeds (Percentage)	Variation in unit value (Percentage)	Falling unit value and volume (Number of years)	Falling unit value alone (Number of years)	Falling volume alone (Number of years)
China:						
Bristles, sorted and bunched	9	21.7	−11.6	5	2	2
Feathers, bed	6	43.3	−25.0	6	—	—
Fur, weasel (not dressed)	8	36.3	−24.4	5	2	1
Oil, tung	10	40.3	−12.1	6	3	1
Skins, goat and kid	9	34.3	−21.0	4	3	2
Tea	11	25.3	−10.6	7	3	1
Tin, bars, blocks, pigs	8	66.2	0.8	3	—	5
Wool, carpet (greasy basis)	5	72.8	−1.7	3	—	2
Colombia:						
Bananas	10	27.9	−1.5	7	—	3
Coffee	12	8.1	−7.2	2	5	5
Petroleum, crude	7	34.1	7.6	2	—	5
Platinum	16	22.7	−8.4	8	3	5
Costa Rica:						
Bananas	14	17.8	−1.9	4	8	2
Cocoa or cocoa beans	12	40.6	−11.7	3	3	6
Coffee	12	32.0	8.3	3	1	8
Cuba:						
Bananas	10	31.8	−6.8	7	1	2
Copper in concentrates	12	45.8	−7.6	9	1	2
Manganese ore	6	41.0	−3.2	3	—	3
Molasses, not for human consumption	6	45.2	−17.0	4	1	1
Pineapples, crated	8	20.4	−0.9	2	—	6
Pineapples, prepared	6	40.2	−9.3	5	—	1
Sisal and henequen	9	53.9	−15.3	6	—	3
Sugar, cane (96°)	12	29.7	−12.0	6	4	2
Sugar, cane (97°)	6	24.4	5.5	2	—	4
Tobacco filler, stemmed	10	16.7	−3.8	6	1	3
Tobacco filler, unstemmed	17	14.7	−1.2	8	2	7
Tobacco scrap	10	15.2	−1.6	6	1	3
Tobacco wrapper	9	19.5	5.2	3	—	6
Tomatoes	11	23.7	0.2	4	2	5
Dominican Republic:						
Bananas	6	40.0	16.8	1	—	5
Cocoa or cocoa beans	12	28.1	−18.3	6	3	3
Coffee, raw	14	21.7	−1.4	2	7	5
Coffee, roasted	5	41.7	8.8	1	—	4
Corn	10	38.4	−12.6	5	3	2
Molasses, not for human consumption	7	30.9	−24.0	4	1	2
Sugar, cane (96°)	9	67.7	−7.2	5	1	3
Ecuador:						
Bananas	6	37.3	0.7	2	—	4
Cocoa or cocoa beans	16	23.3	−7.6	6	5	5
Coffee	12	49.5	−1.9	5	—	7
Egypt:						
Cotton, raw (long staple)	10	35.1	−6.8	4	2	4
El Salvador:						
Coffee	9	26.8	−14.0	3	3	3
Ethiopia:						
Skins, goat and kid	5	53.0	−16.0	3	—	2
French Oceania:						
Chrome ore	10	47.1	−17.6	6	1	3
French West Africa:						
Cocoa or cocoa beans	7	51.0	−14.1	3	1	3

Table III (*continued*)

Exporting country and commodity[a]	Years of falling proceeds (Number)	Decrease in proceeds (Percentage)	Variation in unit value (Percentage)	Falling unit value and volume (Number of years)	Falling unit value alone (Number of years)	Falling volume alone (Number of years)
Gold Coast:						
Cocoa or cocoa beans	7	38.8	−15.8	3	1	3
Logs, mahogany	11	40.9	−4.5	6	1	4
Greece:						
Sponges	10	27.6	14.3	1	2	7
Tobacco, cigarette leaf	7	31.1	−12.9	7	—	—
Greenland:						
Cryolite	12	30.8	1.8	3	2	7
Guatemala:						
Bananas	11	20.0	0.8	6	—	5
Chicle, crude	6	26.2	−15.0	4	2	—
Coffee	10	18.8	−8.5	3	4	3
Haiti:						
Bananas	5	54.8	−5.6	2	—	3
Coffee	10	42.3	3.8	5	—	5
Sisal and henequen	5	14.9	−8.4	1	3	1
Honduras:						
Bananas	12	16.0	1.1	3	—	9
Coffee	9	38.7	−6.4	4	2	3
India:						
Cotton, raw (short staple)	10	32.4	−8.0	5	2	3
Gum, kadaya	6	24.6	−10.5	5	—	1
Jute bagging	7	28.4	−3.4	1	2	4
Jute burlaps	10	20.2	−6.7	5	2	3
Jute, not manufactured	10	31.9	−8.2	5	2	3
Lac, crude, seed	7	29.3	−7.0	4	1	2
Leather, goat, rough-tanned	5	39.5	−2.8	3	—	2
Leather, upper, reptilian and shark-skin	6	54.9	−13.0	2	1	3
Pepper, black	9	55.6	−8.4	3	2	4
Shellac, unbleached	8	26.0	1.0	4	—	4
Skins, goat and kid	11	28.4	−16.9	5	2	4
Tea	9	11.2	−2.6	1	4	4
Wool, carpet (washed)	7	50.0	−5.7	2	2	3
Indonesia:						
Copra	6	61.2	−9.2	4	1	1
Pepper, black	8	31.5	−3.7	1	3	4
Pepper, white	9	32.1	2.3	2	2	5
Rubber, crude	5	40.7	−28.6	3	2	—
Tea	6	19.4	−10.5	2	4	—
Iran:						
Gum, tragacanth	10	37.8	−2.0	6	—	4
Nuts, pistachio (unshelled)	6	59.7	−6.3	3	—	3
Rugs, woollen	8	29.8	−1.5	4	1	3
Iraq:						
Dates	8	15.8	−10.4	5	2	1
Liberia:						
Rubber, crude	9	28.8	−23.3	5	3	1
Rubber, milk or latex	7	19.7	−7.1	3	2	2
Madagascar:						
Vanilla beans	5	41.4	18.2	1	1	3
Malaya:						
Rubber, crude	10	42.5	−22.1	4	3	3
Tin, bars, blocks, pigs	6	33.8	−7.1	4	1	1
Mexico:						
Bananas	9	20.0	−0.1	5	—	4
Chicle, crude	12	27.8	−3.4	8	—	4
Coffee	11	26.7	−7.2	6	—	5
Copper in concentrates	11	37.2	−5.5	7	—	4

Table III (*continued*)

Exporting country and commodity[a]	Years of falling proceeds (Number)	Decrease in proceeds (Percentage)	Variation in unit value (Percentage)	Falling unit value and volume (Number of years)	Falling unit value alone (Number of years)	Falling volume alone (Number of years)
Mexico (continued):						
Cotton, raw (short staple)	12	61.4	−5.8	7	1	4
Fibre, istle or tampico	17	22.7	−2.2	9	1	7
Fish liver	5	23.0	−4.1	3	—	2
Lead ore	7	47.1	2.1	3	—	4
Molasses, not for human consumption	5	56.8	−7.2	1	1	3
Oilcake, cotton-seed	8	50.3	−11.6	5	—	3
Petroleum, crude	19	34.0	−1.7	9	3	7
Sisal and henequen	14	24.2	−5.7	3	4	7
Tomatoes	8	36.2	−1.3	3	—	5
Vanilla beans	13	33.9	−5.7	6	1	6
Zinc, blocks	7	43.0	7.4	1	1	5
Zinc ore	5	46.2	1.8	2	—	3
Mozambique:						
Sisal and henequen	11	52.4	2.7	3	—	8
Newfoundland:						
Copper in concentrates	5	40.0	11.7	—	1	4
Nicaragua:						
Coffee	9	42.5	−10.6	4	1	4
Nigeria:						
Cocoa or cocoa beans	7	39.1	−6.7	2	2	3
Skins, goat and kid	16	33.5	−5.8	6	2	8
Panama:						
Bananas	9	21.2	−4.1	4	3	2
Cocoa or cocoa beans	12	35.6	−2.4	6	2	4
Paraguay:						
Tanning extract, quebracho	10	38.7	−1.9	3	—	7
Peru:						
Copper in concentrates	9	58.1	1.1	3	—	6
Cotton, raw (long staple)	6	31.3	8.2	1	1	4
Lead, bars and pigs	6	53.3	4.3	1	—	5
Lead ore	5	53.6	3.0	1	—	4
Sugar, cane (96°)	7	49.9	−26.0	6	1	—
Philippines:						
Coconut meat	6	33.0	−15.8	3	1	2
Copra	11	39.5	−10.9	7	2	2
Fibre, manila	7	40.0	−17.5	6	—	1
Oil, coconut	9	25.3	−20.4	5	2	2
Oilcake, copra	7	52.6	−22.3	6	—	1
Southern Rhodesia:						
Chrome ore	8	24.2	2.3	2	—	6
Surinam:						
Bauxite, crude	7	2.9	1.0	5	—	2
Trinidad and Tobago:						
Cocoa or cocoa beans	14	28.0	−2.4	3	3	8
Fuel oil, residual	5	49.5	−5.4	3	—	2
Turkey:						
Nuts, filbert (shelled)	11	31.2	−3.5	4	2	5
Opium	15	31.3	−1.9	7	3	5
Tobacco, cigarette leaf	8	43.9	−5.6	6	—	2
Uruguay:						
Beef, canned	8	30.5	3.8	2	1	5
Venezuela:						
Cocoa or cocoa beans	10	30.1	−5.2	5	1	4
Coffee	12	25.8	−5.3	5	1	6
Petroleum, crude	8	27.1	−5.2	5	—	3
AVERAGE, 170 ITEMS		*−36.3*	*−5.8*			

Source: See appendix A; for periods covered, see table I.

[a] The number of items was limited by the exclusion of those for which at least five years of falling proceeds could not be computed and for which corresponding data for variations in unit value and volume were not available. Countries whose export trade was vitally affected by the Second World War were also omitted from the calculations. Thus the number of items (170) is smaller than the 218 listed in table I in appendix D.

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Printed in U.S.A.
72695 - December 1952 - 2700

Price $1.00 (U.S.)
(or equivalent in other currencies)

United Nations publication
Sales No.: 1952.II.A.1